

IRON AGE

SEPTEMBER 13, 1951

VOL. 168 NO. 11

THE IRON AGE
Editorial, Advertising and Circulation
Offices, 100 E. 42nd St., N. Y. 17, N. Y.

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National Business Publications

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THE IRON AGE

DIGEST

of the week in metalworking

A Letter to Our Readers

Dear Reader: Our constant job is to make THE IRON AGE more interesting and valuable to you and easier to read. To do this we've asked many of you personally for your suggestions. And we've heard from many thousands of you by mail. This issue reflects the changes most of you said you wanted.

First, the news section is moved forward. It is preceded by *Newsfront* on p. 99, and starts with a weekly *Special Report*, p. 101. The news of the week is now departmentalized for your convenience. Our aim here is to make it easier to find the news you want to read and easier to read that news when you find it. Columns: Washington, Automotive, West Coast and Machine Tools—follow immediately.

At the end of the news section you'll find *Iron Age Salutes* and *Iron Age Introduces*.

Technical articles follow on p. 151 in a solid easy-to-read unit.

The technical section concludes with *Free Publications* and *New Equipment*.

The Iron Age Summary—Steel Outlook, formerly well forward, now leads off the markets and prices section, p. 191. It is followed by *Market Briefs*, with nonferrous, scrap and other markets and prices in the same order as in the past.

The rearrangement of editorial material is now so logical and orderly that you should find your IRON AGE reading easier and more profitable than ever before.—*The Editors*.

CALL TRUCE ON MATERIALS BIDDING MELEE

PAGE 101 The inflationary spiral on scarce raw materials needed for defense and revived international industry rose like a corkscrew. International Materials Conference was formed to make sure that all nations could get a fair share of the pot at fair prices. AN IMC decision on copper is awaited.

MURRAY MOVING FOR HIGHER STEEL WAGES

PAGE 104 Phil Murray is getting ready to turn up the gas under the simmering steel labor pot. In fact, he may already have applied a little heat. Pittsburgh believes that the steel union leader may again ask the steel industry for an early opening of negotiations for a new labor contract.

STRUCTURAL STEEL CUTS JAR ROAD PLANS

PAGE 107 Plans for smoother riding along highways hit a roadblock last week. DPA slashed fourth quarter structural steel requirements of the Bureau of Public Roads by 57 pct. The roadbuilding and improvement slowdown that is inevitable strikes at a time of the utmost military and commercial need.

IS RESTUP A FREEZEUP ON TAX WRITEOFFS?

PAGE 127 Mobilizer Wilson has decided against any early resumption of issuing fast tax writeoff certificates—but it is not official yet. Thus the 60-day moratorium may be extended indefinitely. One U. S. official got to the pith of the matter: "Writeoffs are useless without materials to build."

POPULARITY OF CARBONITRIDING INCREASES

PAGE 151 A survey of carbonitriding practice reveals the process is being used in 250 plants employing over 400 furnaces. Wide variety of parts treated includes forged parts, stampings and cast iron. Increase in popularity is due to several reasons, in addition to cost savings of the process.

HOW WELDING SAVES BROKEN TOOLS & DIES

PAGE 162 Materials shortages make it imperative that broken or worn tools and dies not be ignored. Often they can be repaired or adapted to other uses with the aid of welding. If entirely unusable, they're still valuable as premium-priced scrap. Tool salvage saves time, money and critical material.

DUPLICATE ORDER CANCELLATIONS ARE PUNY

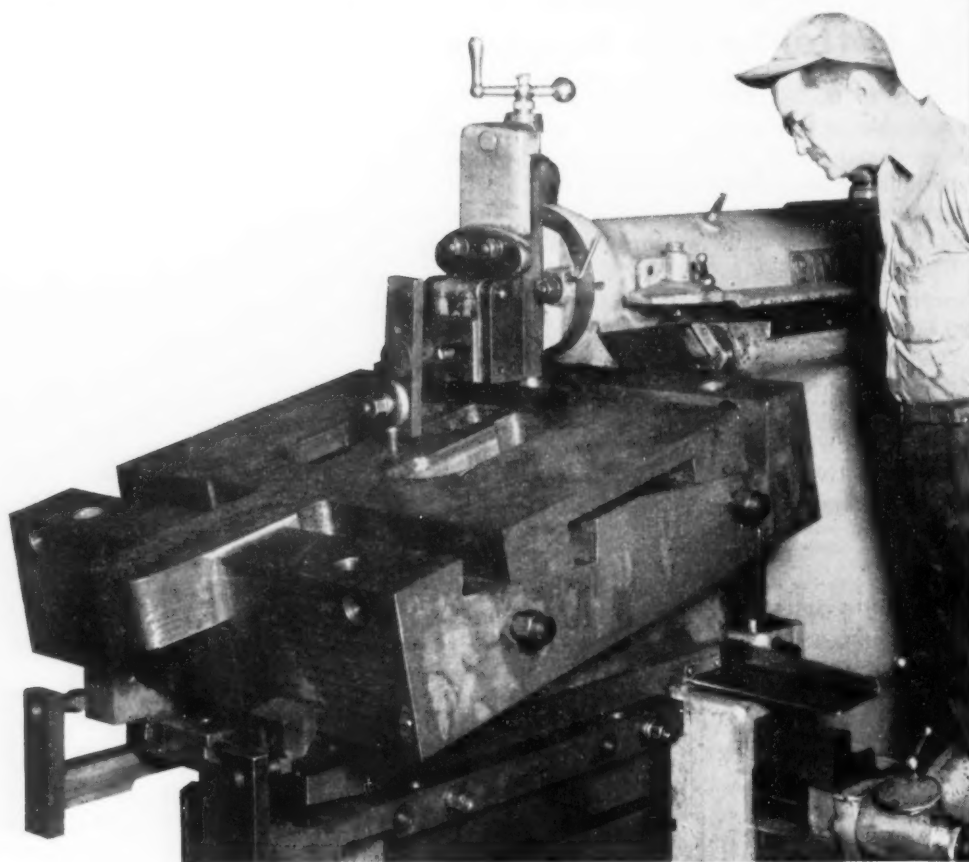
PAGE 191 Hope that duplicate order cancellations would help break the fourth quarter steel order jam appears to be a forlorn one. Producers are in a spot with customers who are told by Washington to check with mills for space created by cancellation of duplicate orders. But first quarter looks better.

REPORT ON CONTINUOUS CASTING OF STEEL

NEXT WEEK Continuous casting of steel on a commercial scale is nearing reality. The only major problem remaining is a sufficient supply of molten metal to the machine. Continuously-cast slabs and rounds are now being used in conventional rolling mills. Both carbon and stainless steels are cast.

Cincinnati Shapers are

versatile money savers...



Eight to ten hours' work cut to fifteen minutes in this unusual application of a versatile Cincinnati Shaper.

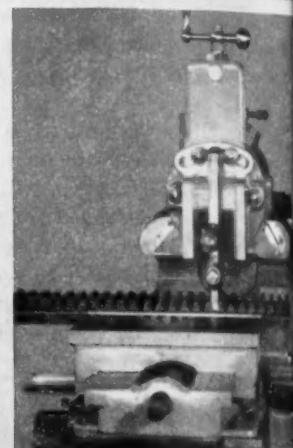
Hand scraping the mating surfaces of press bed bolsters required eight to ten hours. On this Cincinnati Shaper the lapping operation replacing the hand scraping method takes only fifteen minutes.

Versatile Cincinnati Shapers, with low tooling and set-up costs, bring to your shop a money-saving "handy man."

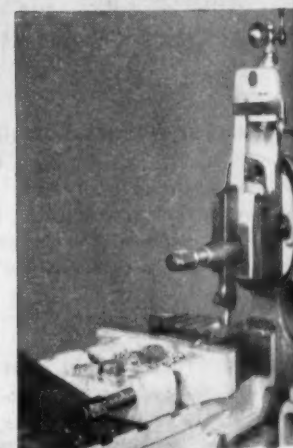
Write for Catalog N-5, illustrating the complete line of powerful, accurate and versatile Cincinnati Shapers. You will find just the size and type for your shop.



- 1. Internal Shaping**
Many irregular shapes are machined with a simple extension tool.



- 2. Maintenance and Repair**
The unusual versatility of a Cincinnati Shaper is invaluable for this work.



- 3. Contouring**
A great variety of shapes are automatically machined with tracer control.



THE CINCINNATI SHAPER CO.

CINCINNATI 25, OHIO U.S.A.
SHAPERS · SHEARS · BRAKES

There Is No Easy Way

IF a maniac runs amuck people have to do something about it. Negotiating isn't the answer.

If you do business with someone you know has no respect for honesty, who changes his signals to suit himself and does not believe in any ethical principles, you should have your head examined—unless you are on to all his tricks.

Nations are no different than people. We found that out. It looks as if we were taken in by Korean cease-fire talks. We will be taken in many more times before we and our allies fully realize that the United Nations must have tremendous power behind it.

We know that Russia and her puppets have not and never will deal honestly with other nations. They understand only force. No matter how much we prate about peace and abhor military buildups for defense there is no other course to follow if we are to be safe.

We and our allies will, in a few years, have big armed forces and substantial defenses completed. We can ask the question "what then?" That is only a catch question and shallow thinking.

Japan could some day decide that Communism is her road. How do we know? Western Germany and other western powers might change sides in a final crisis. That doesn't mean that we should stop everything and crawl into our hole.

It doesn't mean that we shouldn't try to prevent war. It does mean that anyone who wants to go back to the good old days of no wars and "happiness unlimited," must put those ideas aside until we know where we are going in this world. How long that will take is anyone's guess, but it isn't anywhere in the near future.

To protect our country and assist our much needed allies we must have, among us, power far greater than slave nations. Only then can we see what Russia and her satellites will do. They may continue their present tactics. If they do it is our job to match them in strength and beat them in action—no matter how long it takes.

We must some way get out of this dismal position of letting Russia beat us to the gun every time. As we get more experience in this rough and tumble world we may start gaining on all fronts. Now we seem to act only after the Communists force us to.



Editor

IT'S THE Cost per Cut THAT Counts

Study these high production, low cost figures on three Motch & Merryweather Circular Sawing Machines

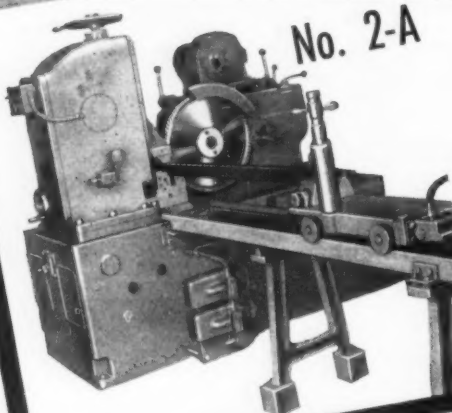
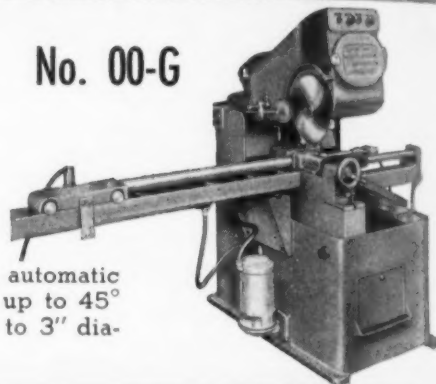
Make your own study of the cost per cut in your metal-sawing department. Then find out from Motch & Merryweather how much production at lower cost you can get on M. & M. Circular Sawing Machines, using our Triple-Chip blades.



Operation: Steel door frames (mitre cut).
Material: Rolled steel shapes 6" wide x 1/16" thick.
Production: 200 pieces per hour.
Tool cost per piece: \$.0002.

M. & M. No. 00-G Circular Sawing Machine. Manual or automatic stock feed. Readily adaptable to making cuts at angles up to 45° as well as high production square cut-off. Capacity: up to 3" diameter round; shapes—up to 3-3/8" x 6".

No. 00-G



No. 2-A



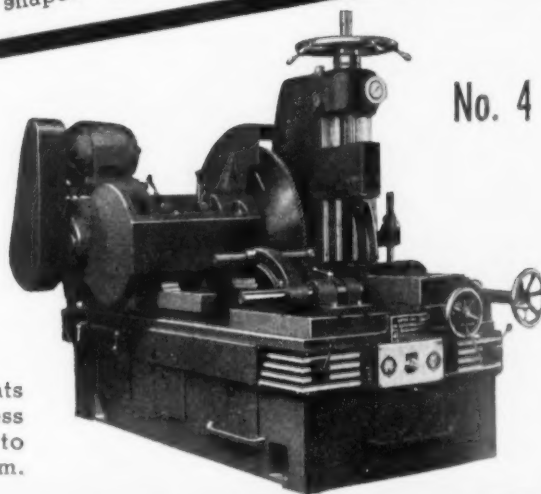
Operation: Rocket nozzle stock cut to length.
Material: S. A. E. 1020, 5" diameter.
Production: 60 pieces per hour.
Tool cost per piece: \$.001.

The No. 2-A machine pictured at the left has automatic stock feed up to 72" cut-off lengths. It is offered also with manual stock feed. Capacity: up to 6-1/2" diameter round; structural shapes—up to 5" x 12".



Operation: Forging billets cut to length.
Material: S. A. E. 1045, 14" square.
Production: 6 pieces per hour.
Tool cost per piece: \$.12.

No. 4. Widely used in steel and structural steel plants and forge plants sawing all types of forging, stainless and titanium alloys, die block steel, etc. Capacity: to 17" dia. round; structural shapes up to 24" I-beam.



No. 4

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715 PENTON BUILDING • CLEVELAND 13, OHIO
Builders of Circular Sawing Equipment, Production Milling, Automatic and Special Machines

PRODUCTION-WITH-ACCURACY MACHINES AND EQUIPMENT



Dear
Editor

Extrusion

Sir:
Will you kindly advise as to where we can obtain further information and possibly a sample of the materials discussed in the article "Phosphate Lubricant Aids Cold Extrusion of Steel" published in the July 26th issue of THE IRON AGE.

J. J. FERGUSON
Chief Engineer
Continental Can Co., Inc.
Fibre Drum Division
Van Wert, Ohio

For further information contact the Pennsylvania Salt Mfg. Co., Widener Bldg., Philadelphia, Pa.—Ed.

Who Makes It?

Sir:
Will you kindly tell us the name of the Tool Holder of collet type shown in use on a boring job on page 98 of the August 16, 1951 issue of THE IRON AGE.

JOHN M. CLAUSER
Mideale Dental Supply Co.
St. Louis, Mo.

The collet type tool holder illustrated on page 98 of our August 16 issue is sold by Montgomery & Co., Inc., 55 Park Place, New York 7, N. Y.—Ed.

Defense Directory

Sir:
May we please have six copies of the Defense Personnel Directory which appeared in the August 30th issue of THE IRON AGE.

GEORGE A. EICHERT
Tennant, Sons & Co.
New York 17, N. Y.

Yes, they're free as long as supply lasts.—Ed.

Not Fatal

Sir:
It would be very much appreciated if you would kindly send me tear sheets of the article entitled "18-8 Can be Cured" which appeared in THE IRON AGE for August 2, 1951. Pages 81-85.

T. V. SIMPKINSON
Physical Metallurgy Division
Department of Mines & Technical Surveys
Ottawa, Ontario

Purchasing

Sir:
We would appreciate it very much if you would send us 6 reprints of the article "Purchase for Performance" by E. S. Page which was published in your Aug. 16 issue, p. 109.

H. J. NESS
President
The Lithium Co.
Newark, N. J.

Suggestion

Sir:

The first thing I turn to on Thursday in THE IRON AGE is the Editorial. Why can't you put a tab on this page, colored in some way, so that I can pick it out easier. I know you have a lot of colored ads, so it might be difficult to color the editorial page, but we do love to read these editorials and something ought to be done to mark the page so that we can find them. There are many of my friends who talk about these weekly.

By the way, I think a good editorial would be one on "Our March Toward Communism." I worry over the way in which we are being taxed and taxed and now again another talk of increase to the point where business incentive is no longer with us. And too, big business is taking over and the small aggressive business man is being driven out. He is almost ready to give up. This march has been going on for some time. The government which is supposedly in favor of small business seems to be unconsciously doing everything in their power to kill the little fellow...

EDWARD L. SOLOMON
President

Max Solomon Co.
Pittsburgh 16, Pa.

Creates Stir

Sir:

Your piece in the August 23rd issue also created quite a stir.

Of course, the story itself is perfect from our point of view. As you know we were very fearful of making some of our own people think we had done a smart trick.

Whereas, we deeply appreciate the complimentary vein in which you write, I am equally aware of the care you employed and you do pack a lot of interest into a brief readable story.

DAVID DILLMAN
Manager, Public Relations
Inland Steel Co.
Chicago 3, Ill.

Help Wanted

Sir:

I am holder of a large block of land with a heavy rim of limestone.

I notice your magazine quotes a market on every conceivable thing used to make a ton of steel but the limestone, 34,000,000 tons of which was used for this purpose in 1948. The latest year for which I have found market valuations.

Will you kindly advise me where I could find a recent market for limestone and if available a list of the principle suppliers of this product.

ALDEN D. PERLEY
West Carrollton, Ohio

List of Ohio limestone dealers sent.—Ed.

how to get an answer on spring steel requirements



Quick answers on "in stock" availabilities of spring steel (annealed or tempered) are assured at Kenilworth. At this pictured pentagon desk current inventory records make possible immediate response to your inquiries, by phone, wire or letter. Kenilworth's specialized spring steel department is well stocked with a wide variety of types, sizes and finishes—ready to meet your exacting specifications in shipment after shipment regardless of size of order. Try us today.

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Simply clean
surface



STEP
1

Simply apply **dy✓chek**
Dye Penetrant
(by brush, spray,
or dip)



STEP
2

Simplified Non-Destructive Testing

Simply remove excess dye
with **dy✓chek**
Dye Remover



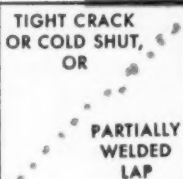
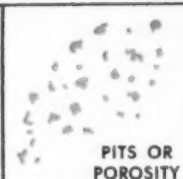
STEP
3

Simply apply
dy✓chek
Developer



STEP
4

AND...
FLAWS ARE
REVEALED



ANSWERS TO YOUR QUESTIONS

- Q. What is Dy-Check?
- A. Dy-Check is the revolutionary new dye penetrant method of inspection offered *exclusively* by Turco Products, Inc.
- Q. What does it do?
- A. Dy-Check reveals the location, extent and nature of any flaw having a surface opening or discontinuity . . . and in any metal.
- Q. What kinds of metal surfaces?
- A. Magnetic, non - magnetic

- castings, forgings, machined parts, plate, sheet tubing, pipe and weldments.
- Q. What about special equipment?
- A. No special lights, booths, current supply or installations. Dy-Check consists of three special liquid compounds easily applied by brush, spray or dip methods.
- Q. What about expense?
- A. No investment, royalties, etc. Liquids are moderately

- priced. Dy-Check materials cover large areas per gallon.
- Q. How about preventative maintenance in the field as well as plant use for manufacturing and receiving inspection?
- A. The complete portability of Dy-Check is one of its greatest advantages.
- Q. Where can I use Dy-Check?
- A. In use in practically every metal process. In case of specialized procedures, describe the nature of your problem.

SAVE TIME AND MONEY Dy-Check is a dollar-and-sense approach to receiving, intermediary and product inspections. Write today on your company letterhead describing your application.



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and be sure!

HERE ARE FACTS ON

dy✓chek
TRADE-MARK

the dye penetrant
inspection method
PATENT PENDING

Fatigue Cracks

By Charles T. Post

Threat From Within

During dull days on the home front of World War II, an enterprising newspaper reporter occasionally would dress up in a Nazi uniform and walk bumptiously down Main St. Of course no one recognized him, and, presto, there was a story for page one.

Your favorite family journal's machinery editor, George Elwers, has no dull days. But, returning from a plant visit in Brooklyn the other day, he satisfied himself that vigilance for Russian spies exists only in Congressional committees.

George boarded a subway train and rode all the way up to Grand Central with a handful of jet engine blades, a roll of blueprints, and a Russian magazine. None of his fellow riders gave him as much as a dirty look. The real Russian spies can't be so sharp either, for there were no propositions to buy his cargo. Perhaps they are waiting for George's complete article, which will deal, alas, not with Russian spies, but with a new method of machining jet blades.

On With Rearmament

Washington doesn't miss a beat in its efforts to push the rearmament program. For instance, in Defense Production Aids Bulletin No. 14, issued by the Department of Commerce to help small business get into the swim, we find this portentous question:

"Have you a regular schedule for washing windows and skylights?"

If you have, we suppose you'll be able to see a subcontract passing on the street or dropping from the sky.

Page The Bull

Cora Emery of Arthur D. Little, Inc., calls our attention to a slur against our old friend, the Bull of the Woods, by no less eminent a personage than Roy T. Hurley, president of Curtiss-Wright Corp. In an interview with *Product Engineering* magazine, Mr. Hurley related, "... we found that some forgings machined very freely while others of the same alloy were difficult to machine. . . . When we tried to find out why, we had to go to a physicist and an electron microscope to get the answer.

It was not the sort of thing that the old master mechanic, the 'Bull of the Woods' could solve in the shop."

We're not so sure about that. We'll bet Mr. Hurley never even asked him.

Apronym

Charles W. Adams of Arvida, Quebec, is sure that the man who wrote the article, "Digestion in Tilapia Esculenta," is well fitted for his job. The author is G. R. Fish of the East African Fisheries Research Laboratory. Seems to us the article could be autobiographical. Wonder if Mr. Fish has ulcers.

Puzzlers

The last frog out of the well in the Aug. 16 puzzle could have come out first if he had jumped only 16% faster. The same one, Frog "D," used the least energy followed by "A," "B" and "C." The relative values of frogpower used turns out to be "D," 3 units, "A," 6 units, "B," 8 units and "C," 12 units. R. W. Huff, Canton, Ohio, was the first one to tackle this one.

When we received four letters from C. E. Norton, Chicago, C. G. Heilman, Commonwealth Industries, Inc., C. E. Blass, Talon, Inc., and H. L. Ludwig, U. S. Steel Export Co. all stating that the greatest number of combinations of coins was five we decided that must be it. Then came R. W. Huff, Canton, who entered his figure of 3,404 combinations. His figure is based on the fact that there are four little known but nevertheless valid coins which still satisfy the conditions of the problem. These coins are the half-cent, two-cent, three-cent and twenty-cent pieces. We hereby declare Mr. Huff the winner.

L. F. Calzi, Philadelphia, says that one of the older steel mills is poorly designed, for at one end of the mill is a passageway 27 ft wide which makes a right angle turn into another narrower corridor. The mill has started to produce girders up to 64 ft in length which must be transported down this passageway. How wide must they make the second corridor so the girders may be moved through when in a horizontal position? Neglect the width of the girder.

Lapping
Carbide
20% Faster!



Carbide spray nozzle orifices are finished to tolerances of .0005" at Spraying Systems Company, Bellwood, Illinois. New Elgin DYMO-C diamond abrasive used in place of diamond powder-oil mixture produces more pieces per hour and conserves diamond, too!

ELGIN
DYMO-C*
diamond abrasives

*C FOR CARBIDE

Here is a complete new diamond abrasive specially prepared to speed carbide finishing operations. It cuts faster, won't work back on the lap, won't settle and comes ready to use without time-consuming mixing. Write for complete information—ask for a free demonstration.

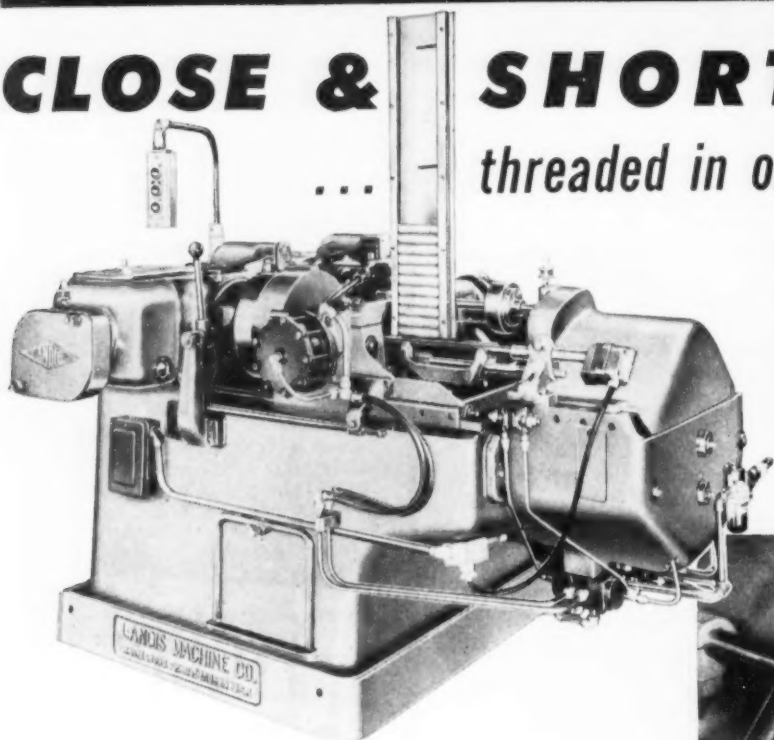
ALL ELGIN DIAMOND ABRASIVES ARE COMPLETELY PRODUCED BY ELGIN AND CERTIFIED TO CONFORM TO U. S. BUREAU OF STANDARDS SPECIFICATIONS.

ABRASIVES DIVISION

ELGIN NATIONAL WATCH CO.
ELGIN, ILLINOIS

A REVOLUTIONARY NEW DEVELOPMENT

CLOSE & SHORT NIPPLES ... threaded in one automatic operation



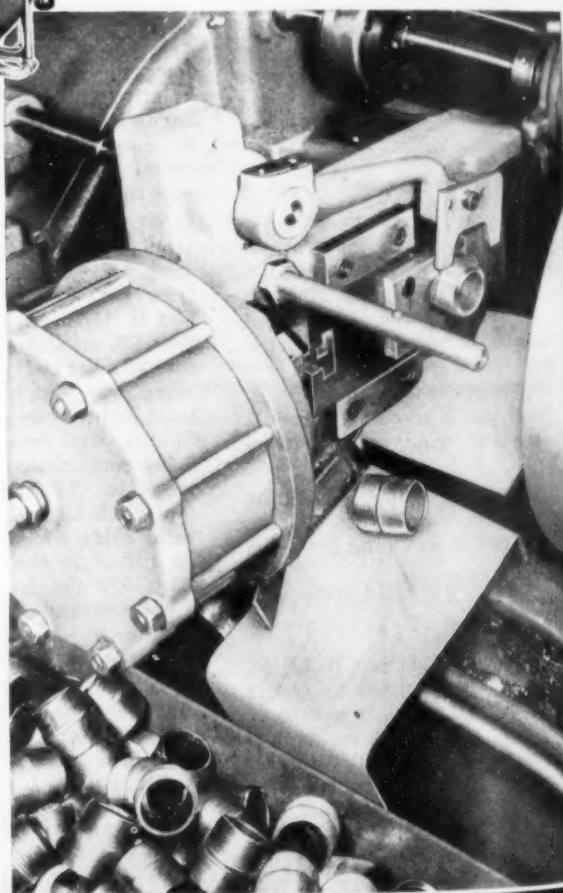
The LANDIS Automatic Close Nipple Threading Machine, recently perfected by Landis Thread Engineers, will produce commercial standard close, short, and special short nipples at rates ranging up to 625 per hour. These machines are built in two size ranges—one for $\frac{1}{2}$ " to $\frac{3}{4}$ " nipples—the other for 1" to 2" nipples.

This new LANDIS Close Nipple Machine is completely automatic—threading, reaming, and chamfering close nipples on both ends without secondary manual handling. Nipple blanks are fed from a magazine, transferred automatically from one carriage to the other, and ejected when finished.

Tremendous savings in labor cost can be realized—PLUS other savings through lower tool cost and increased production. The operator is required only to fill the magazine and give supervisory attention. Thus a SINGLE operator can handle TWO OR THREE LANDIS Close Nipple Machines, depending on the pipe size.

New construction features contribute to longer life and more efficient operation. Special built-in safety devices guard against damage from jams and ease the supervisory job of the operator. Write today for complete information and specifications.

Formerly the production of close and short nipples was featured by high labor cost, low output and tedious manual handling. NOW . . . here is a modern machine tool which mass-produces these nipples in a single continuous automatic operation.



LANDIS Machine COMPANY • WAYNESBORO PENNSYLVANIA

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Conventions & Meetings

Sept. 16-19—American Institute of Chemical Engineers, national meeting, Hotel Sheraton, Rochester, N. Y. Institute headquarters are located at 755 Ridge Road West, Rochester, N. Y.

Sept. 21-23—National Assn. of Waste Material Dealers, Inc., annual fall meeting, Saranac Inn, Saranac Lake, N. Y. Association headquarters are at 271 Madison Ave., New York.

Sept. 24-26—National Truck Body Manufacturers & Distributors Assn., annual convention and supplier's exhibit, Haddon Hall, Atlantic City, N. J. Association headquarters are at 346 Connecticut Ave., N. W., Washington.

Sept. 25-26—Steel Founders Society of America, fall meeting, The Homestead, Hot Springs, Va. Society headquarters are at 920 Midland Bldg., Cleveland.

Sept. 26-28—American Society of Mechanical Engineers, fall meeting, Hotel Radisson, Minneapolis. Society headquarters are at 29 W. 39th St., New York.

Sept. 26-28—National Metal Trades Assn., annual convention, Palmer House, Chicago. Association headquarters are at 122 S. Michigan Ave., Chicago.

Sept. 26-29—Marking Device Assn., national convention, Edgewater Beach Hotel, Chicago. Association headquarters are at 134 N. LaSalle St., Chicago.

Oct. 1-2—American Machine Tool Distributors Assn., annual meeting, Haddon Hall, Atlantic City, N. J. Association headquarters are at 505 Arch St., Philadelphia.

Oct. 1-4—Assn. of Iron & Steel Engineers, annual convention, Sherman Hotel, Chicago. Association headquarters are at 1010 Empire Bldg., Pittsburgh.

Oct. 1-4—Society of Industrial Packaging & Materials Handling Engineers, annual Industrial Packaging and Materials Handling Show, Cleveland Public Auditorium, Cleveland. Society headquarters are at 20 W. Jackson Blvd., Chicago.

Oct. 3-6—Pressed Metal Institute, annual meeting, Hotel Drake, Chicago. Institute headquarters are at 13210 Shaker Square, Cleveland.

Oct. 8-13—Concrete Reinforcing Steel Institute, semi-annual meeting, Grove Park Inn, Asheville, N. C. Institute headquarters are at 38 S. Dearborn St., Chicago.

Oct. 9-12—Electrochemical Society, national convention, Hotel Statler, Detroit. Society headquarters are at 235 W. 102nd St., New York.

Oct. 10-12—Procelain Enamel Institute, annual forum, Ohio State University, Columbus. Institute headquarters are at 1010 Vermont Ave., Washington.

Oct. 12-14—Metal Treating Institute, annual meeting, Hotel Detroit-Leland, Detroit. Institute headquarters are at 271 North Ave., New Rochelle, N. Y.

Oct. 15-17—American Institute of Mining & Metallurgical Engineers, Institute of Metals Div., fall meeting, Detroit-Leland Hotel, Detroit. Institute headquarters are at 29 W. 39th St., New York.

Oct. 15-18—American Gas Assn., annual convention, St. Louis. Association headquarters are at 420 Lexington Ave., New York.

Oct. 15-19—National Metal Congress & Exposition, Detroit. American Society for Metals headquarters are at 7301 Euclid Ave., Cleveland.

You may think we're in the clouds . . . but **DIMENSIONAL ACCURACY CAN** benefit your product.



READ THESE down-to-earth FACTS!

BEER BOTTLES had a way of shattering during the capping operation. Now a Federal Dimension-Control Gage shows up any thin spots when the bottles are being made—saves bottles, beer, bottling time, and contributes to the safety of brewery personnel.

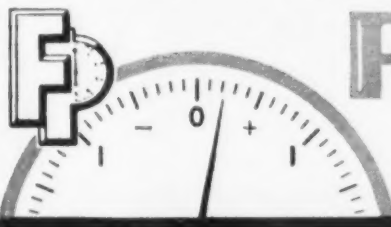
TIN CANS holding insecticide under pressure were leaking. By inspecting vital dimensions with a Federal Indicating Gage, the strength and tightness of the cans have been greatly improved, resulting in big savings to the manufacturer and wider acceptance for the product.



RUBBER TILE is another "non-precise" product now being controlled with Federal Gages. By gaging the rubber while it is calendered, the manufacturer obtains a product of uniform thickness, thus avoiding costly reprocessing of reject goods. The Federal Continuous-Measuring Gage also prevents wastage of rubber due to over-thick tiles.

These examples are typical of many manufacturers who have discovered it pays to give careful consideration to dimensional control. If you have ever said to yourself "Our requirements aren't accurate enough to need precision methods"—**WATCH OUT!** You may be paying a higher price than you think for scrap, rework, spoilage, breakage, wasted materials, etc.

Federal gage-engineers will be glad to show you how Federal Dimension-Control Gages can help you. Write for recommendations. **FEDERAL PRODUCTS CORPORATION**, 1139 Eddy Street, Providence 1, Rhode Island.

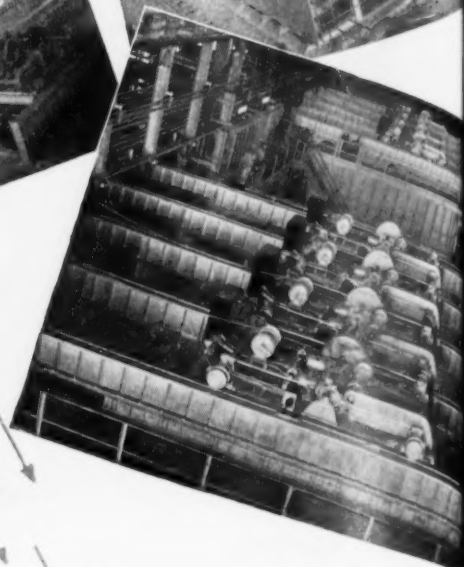
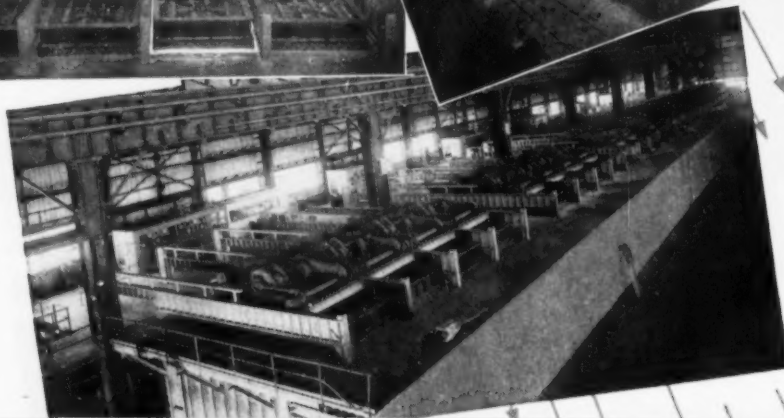
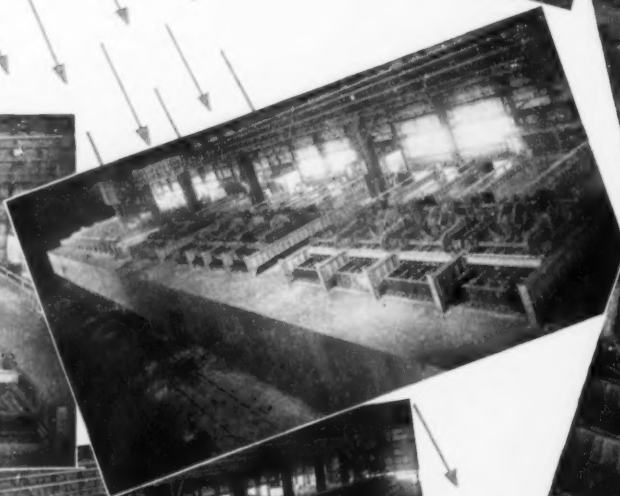
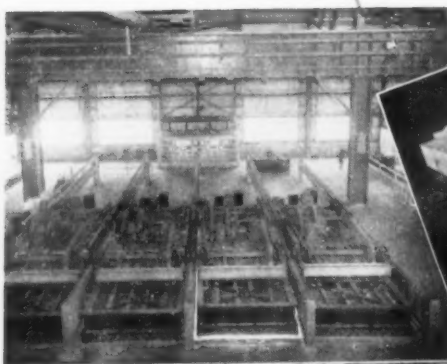
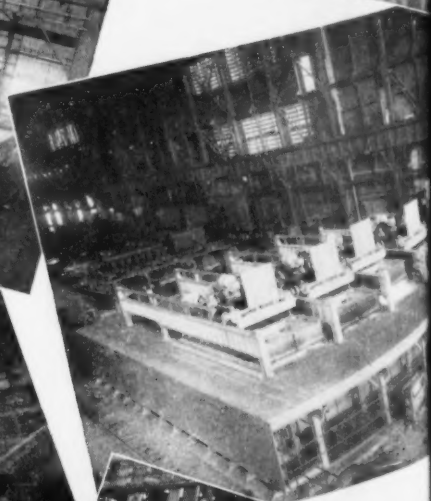
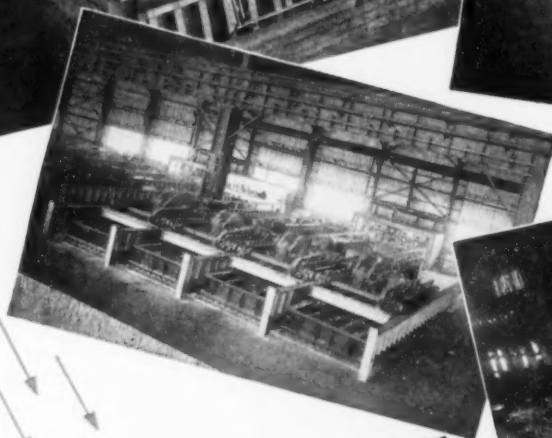
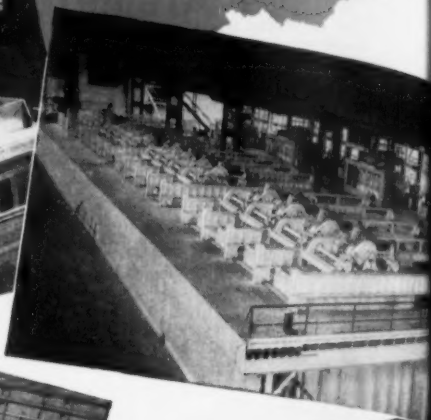
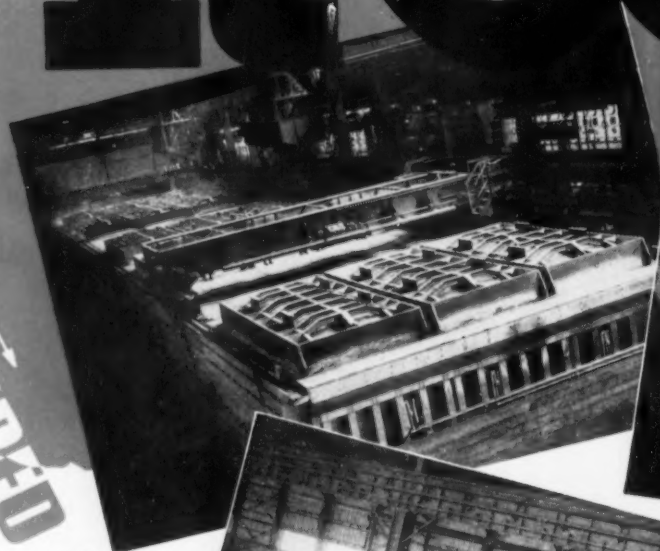


FEDERAL

Largest manufacturer devoted exclusively to designing and manufacturing all types of **DIMENSIONAL INDICATING GAGES.**

PROOF

ONE-WAY FIRED PITS



THE IRON AGE Newsfront

- Government insistence on renegotiation is stifling some defense projects. Some jobs are too big a gamble to undertake for the profit allowable under renegotiation. Typical is a strategic metal used by the Atomic Energy Commission. Small scale production is successful; volume production might prove very valuable to the AEC but management can't take the risk of swinging into a big operation.
- The soft coal industry is now fully sold on the value of a good research program. A program calling for heavier expenditures than it has made heretofore has been outlined and probably will be approved soon. Much of the work would be designed to recover some of the markets lost to competitive fuels.
- Because their steel quota is based on 1950 operations--a slow period--some oil well drillers are faced with this problem: Either cut back operations or buy pipe in the premium market. Most feel it's cheaper to pay the premium and are doing so.
The quota system is also causing some unbalance in jobber steel stocks.
- An improved electromagnetic metal pump uses a series of insulating barrier vanes inside the metal conduit to reduce current loss and increase pumping efficiency.
- Addition of rare earths to certain wrought steel alloys of the 4100 and 4300 series have almost doubled their impact strengths. The impact tests were transverse and were made at room temperature.
- Staking as a substitute for screws or nuts and bolts in joining clock and instrument parts is now being done by applying pressure instead of the usual impact method. Both hydraulic and pneumatic presses are used, with a sharp drop in number of rejects. Quieter, easier operation also lessens worker fatigue.
- Some ECA assistance is beginning to have strings attached. For example, if aid is to buy equipment for mining or recovering strategic metals or minerals (tungsten in the recent case of Portugal) an option to buy at least part of the output is written into the agreement.
- A midwestern fabricator is having considerable success in punching 0.310-in. holes through 0.247-in. thick type 347 stainless steel. So far, 40,000 pieces have been punched without the need for grinding and with no punch breakage.
- A new organic vegetable compound treated with carnauba wax being used for heavy pressure blanking operations on high carbon high chrome steels is reported to increase tool life by as much as 500 pct.
- More American ships may be built abroad. Price isn't the only factor; steel tonnage requested by U. S. shipbuilders for the fourth quarter was slashed 50 pct, though it is only slightly less than was allotted in the third quarter. Large orders for tankers (Gulf) and ore carriers for Liberian ore (Republic) have already gone to England. Costs there are substantially lower (so are wages) and the government allocates any steel needed to bring in dollars.

ELIMINATE MOTOR FAILURE with class **(H)** insulation made with DOW CORNING SILICONES

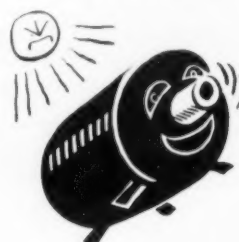


Wet Motors



are a constant threat to your production schedules . . . unless they're wound with Dow Corning Silicone (Class H) insulation. Here's evidence of the fact that Class H has at least 10 times the wet insulation resistance of the next best class of insulating materials. At Virginia-Carolina Chemical Corporation's Homewood mine, a 300 hp., silicone insulated motor was back in service 3 hours after flooding with mud and waste water. Under the same conditions, an identical Class B motor had to be reworked and rebaked. Similar experience over the past 5 years has persuaded many chemical companies to specify Class H exclusively for all condensate and centrifugal pump motors.

Hot Motors



die young . . . unless they're protected with Dow Corning Silicone (Class H) insulation. Here's evidence of the fact that Class H insulation makes hot and hard working motors last 10 times longer than they ever did before. Silicone insulated spinner bucket motors in rayon mills last 6 to 24 times as long as Class A motors. Silicone insulation makes the high speed, rapidly reversing motors used by Cogsdill Twist Drill Company last 12 to 100 times as long as Class A or Class B motors. In a large steel mill, a crane hoist motor had 4 to 42 times the life of a Class B motor.

Keep 'em running with Dow Corning Silicones

Write today for list of Class H motor manufacturers or listing of Class H rewind shops now located in all major industrial centers.

Address Department O-9

DOW CORNING CORPORATION, MIDLAND, MICHIGAN



ATLANTA • CHICAGO • CLEVELAND • DALLAS • LOS ANGELES • NEW YORK • WASHINGTON, D. C.
In CANADA: Fiberglas Canada, Ltd., Toronto • In GREAT BRITAIN: Midland Silicones, Ltd.

MATERIALS: Free World Unites, Shares

Call truce to bidding melee for scarce materials . . . IMC formed to distribute equitably at fair prices . . . U. S. has heavy stake in stable market . . . Await decision on copper.

The world's raw materials marketplaces had taken on the spirit of an auction as industrial nations bid high for minerals and metals in limited supply. The problem was obvious—getting sense and balance into distribution so that all free nations could get their rightful share of the pot at fair prices.

The solution was formation of the International Materials Conference by heavy-producing Great Britain, France, and the United States—who had most to gain by a stable market.

With a manufacturing capacity dwarfing all the rest, the U. S. was in the midst of the bidding battle. It had to compete with other nations who also had to sustain economies stimulated by post-war industrial resurgence and rearmament.

U. S. Stockpiles—Procurement difficulties multiplied as the vast stockpiling program of the U. S. sought only critical materials. Contentment grew for now inadequate supplies of such items as tungsten, tin, copper, wood pulp, manganese ore, wool. The inflation spiral rose like a corkscrew. Countries without the pocket-book to compete stood at the rim of the buying throng. Other nations who owned raw material resources began to play price poker, extracting all the traffic could bear. Witness the price climbs of tin, wool, etc.

To worsen the situation, the Reds snubbed the world marketplace, grimly withdrawing scarce materials that some day could go to war against them.

Right Approach—IMC did not suddenly become a panacea but it has the right approach. After its formation last January, Washington was picked as IMC headquarters. Other nations joined the cause: Canada, Italy, India, Australia, Brazil, the Organization for European Economic Cooperation, and the Organization of American States. Paying specific attention to defense industry, seven operating committees were started to unravel the tangled raw materials distribution state:

Copper, zinc, and lead
Sulfur
Cotton and cotton linters
Tungsten-molybdenum
Manganese-nickel-cobalt
Wool
Pulp and paper

IMC operates through principles of harmony and horse trading. Operating committees have no dictatorial powers of ordering

this and that done. They can offer recommendations to governments and suggest how much of a strategic commodity nations should get. World shortages are a problem of particular study.

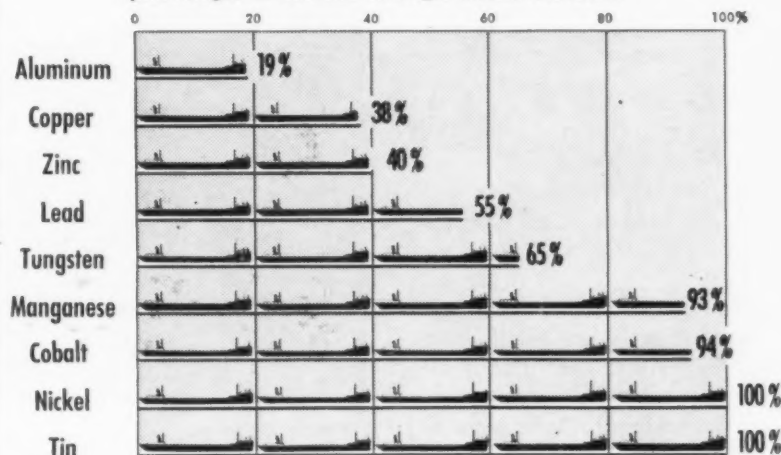
Committee members are entrusted with the task of balancing supply and demand. They cannot bore directly into the question of sky-high prices but stabilizing demand deadens inflation.

Copper Decision—Latest move of IMC came last week on copper. The members voted for fourth quarter world allocation. The U. S. is hoping for a share equaling the 1950 consumption rate.

IMC members consist of nations outside the Iron Curtain. Twenty-seven of them are represented on one or more committees. Committees start with research to compare differences between traditional and present consumption. Defense need is considered and

We Must Import

Last year other free countries furnished us the following percentages of selected strategic metals we used.



Source: President's Economic Report.

Compilation: THE IRON AGE

recommendations for allocations made.

Non-member nations opposed to communism are sent questionnaires and spokesmen are called to discuss their needs. They are not frozen out of the distribution set-up.

Examples of positive IMC action can be drawn from distribution of tungsten, molybdenum, and sulfur. The U. S. was allowed 45 pct of the free world's tungsten in the third quarter while the United Kingdom drew about 25 pct. The U. S. is getting 77.8 pct of molybdenum output and about 70 pct of the sulfur supply.

Defense Important—The ability and determination to produce for defense is serving the U. S. well in drawing a good share of raw materials available. Unanimous agreement of members is necessary for adoption of distribution patterns. Horse trading is the means to agreement.

Although the U. S. has been accelerating production of raw materials, its greater and more varied industrial production has put it deeper and deeper into the market for foreign materials. In a time of defense mobilization, some metals and minerals assume startling importance. (THE IRON AGE, Mar. 8, 1951.)

For instance, we must import 94 pct of our cobalt to make alloy steels; 93 pct of our manganese ore, a must ingredient for steel-making; 65 pct of our tungsten; 38 pct of our copper; 40 pct of our zinc. (See chart on page 101.)

Not a Cartel—IMC is quick to deny its similarity to a cartel, stating a fundamental difference. A cartel restricts production and distribution to keep market prices high. The IMC goal is at an opposite pole.

Accustomed to getting what raw materials they need with help from no one, American industrialists are now more prone to accept IMC's international allocation system. They have had some costly experience bidding for scarce defense materials.

RAIL SCRAP: Uprooted in Cleveland

Crews now starting on project of salvaging streetcar rails . . . Will mean about 4000 tons of scrap for foundries . . . OPS raises price to pay repaving cost. —By Bill Taylor.

Cleveland had a supply of scrap metal lying around in the streets. True, it was in the shape of abandoned street car tracks but desperate need now counter-balances cost of uprooting it and repaving streets. Crews are now beginning to dig up an estimated 4000 tons of scrap rails to be fed to local foundries through National Production Authority's allocations system. To date about 1500 tons of rails have been doled out.

The Cleveland Transit System made a gift of the rails to whoever would take them up. The scrap brokerage firm of Luria Bros. finally got Lipsett, Inc., of New York, to do the job.

Smoother Streets—One spokesman said the crews can remove the track and repave one city

block per day (500 ft.). With the aid of a "Lipulrail," the track is pulled out of the ground after a 10-in. swath of paving block is removed from one side. When the rail is removed a clean-up crew comes along, followed by a paving gang which dumps in concrete plums. Not only are the rails removed, obviating a driving hazard, but a smoother street surface results.

When the project was first announced, NPA immediately allotted the first 850 tons to the foundries. This was followed by a second allotment of 2500 tons now being removed. Though there is much more than 4000 tons of abandoned rail in the city, this is the only amount considered feasible to remove.

Right now it is economically possible to salvage only rail that is imbedded in paving block. If it is sunk in concrete or asphalt the work would be too extensive and the cost too high. As it is, the foundries are paying around \$65 a ton for the rails at present, about \$15 a gross ton more than OPS ceilings for the grade. In this case, however, OPS has established a separate price ceiling to cover the cost of removal, handling and repaving.

Others Interested—Of the hundreds of cities around the country which have abandoned trolley tracks, there are many which have been represented at Cleveland by engineers studying methods used by Lipsett crews and going home with the thought that they could do something similar. If they saw or heard nothing else, they heard plenty of talk about getting every available piece of scrap back to the furnaces.

Credit for the operations in Cleveland should go to Richard



TORCH MAN: Standing in cobblestone rubble of Cleveland street, worker burns abandoned trolley track into sections for lifting. Scrap goes to furnaces and streets are repaved.

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STEEL: Throttle at Half Speed

Structurals governor will keep expansion throttle at half speed for another 6 to 9 months . . . Third of money spent . . . But much was on preliminary work . . . Equipment short, too.

Smith, of the Cleveland Transit System; William Betzler, of Republic Steel, and Jack Levand, of Luria Bros., for laying the groundwork and making necessary arrangements. Mr. Betzler, who buys scrap for Republic, was in Washington talking to NPA about the street rails, when a request for scrap came in from a Cleveland foundry. The foundry got the rail and Mr. Betzler, for Republic, got a pat on the back.

Tungsten:

Kennametal chief replies to Senate critics . . . Portugal to ship more.

The facts were slightly distorted in a Congressional subcommittee report which tried to show Army mishandling of the tungsten problem, thought Philip M. McKenna, president of Kennametal, Inc., Latrobe, Pa.

He wrote a 20-page letter to Lyndon B. Johnson, chairman of the Preparedness Subcommittee of the Senate Committee on Armed Services. In it he said that contrary to the published report the so-called ore-to-ore process using low-grade ores to produce tungsten-carbide projectiles was not new. Kennametal had such a process in 1945 and has improved on it since that time.

Needs No Help—Mr. McKenna continued that the American tungsten industry is capable of doing the defense job adequately. It does not need the "help" of new custom mills and a chemical re-treatment plant similar to that built at Salt Lake City in World War II. He said Kennametal is improving processes, buying mines, arranging for Mexican tungsten, and opening plant expansion.

Meanwhile, Economic Cooperation Administration signed its third agreement with Portuguese wolframite producers. ECA will supply more money and Portugal will repay with bigger shipments of wolframite, raw material from which tungsten is derived. Portugal's mining operations will be expanded with the monetary assistance shelled out by ECA.

Steel's expansion program has not only been slapped in the face by the government's allotment of only half the structurals needed, but the smart from that slap is going to last another 6 to 9 months.

Manly Fleischman, boss of Defense Production Administration, bluntly states that the cutbacks in structural steel needed by the industry for expansion will have

steel companies, DPA estimates dollar-wise that by Oct. 1 about a third (more than \$600 million) of the \$2 billion expansion through 1953 will have been completed.

But what makes it tough is that most of this money has gone into excavation and foundation work with only a little framework up. Fourth quarter goals are not likely to be reached and the cutback will play hob with first and second quarter construction.

Structural Scoreboard

Fourth Quarter 1951, net tons

Program	Need	Receive	Pct
Army	4,059	4,059	100
Navy	7,306	7,306	100
Air Force	31,237	31,237	100
Aluminum	19,010	19,010	100
Ferroalloys	15,514	12,719	82
Refractories	8,736	6,578	75
Foundries	3,883	2,815	72
Iron & Steel	174,957	89,468	51
Other industrial			
expansion	121,723	32,515	26
General business construction	106,574	12,055	11

to be extended through first quarter 1952 and perhaps through the second quarter.

Spending Rapid—Confirming a previous IRON AGE report, DPA stated last week that the steel industry allocation of structurals would total only 89,468 tons, 51 pct of the 174,957 tons necessary to maintain the expansion program at current levels.

Based on progress reports of 67



"Why yes, I'm the foreman. Any objections?"

Dim Future—This is glumly conceded by Mr. Fleischman. With possible capital equipment bottlenecks, the net result may be to force "a revision of actual production schedules which are now estimated at 118,000,000 ingot tons during 1953," he says.

Outlook for first quarter 1952, according to National Production Authority, is that structural steel requirements will still be more than double production rates. On top of this, military demands, which will be met 100 pct, will be increased in the first half.

A total of 60,000 tons were set aside for military needs. Of this roughly 17,000 tons is a reserve to be earmarked. As spot needs show up, steel will be allocated.

No Surprise—Shortage of structurals was one of the big reasons Mobilization Chief Wilson recently ordered a moratorium on approval of certificates of necessity, which offer rapid amortization as an inducement for industry to expand defense production facilities.

The cutbacks will deal a severe blow to expansion plans of several industries. But they did not come as a surprise. Steel industry sources knew that the expansion binge would eventually cause demand for structurals to spiral.

WAGES: Steel Pot Is Simmering

Murray believed ready to turn on more heat . . . Copper settlement and escalator clauses furnish fuel . . . Expect request of 15¢ plus fringe . . . Steel prices to keep pace—By John Delaney.

President Phil Murray of the United Steelworkers of America (CIO) is getting ready to turn up the gas under the simmering steel labor pot. In fact, he may already have applied a little heat.

A slight hint was heard in Pittsburgh this week that the steel union leader may again ask the steel industry for an early opening of negotiations for a new contract. If Mr. Murray has this in mind, the request will not be long coming.

Contract Terms—Last year the USW persuaded steel companies to meet with them early in October. And an agreement calling for an average wage increase of 16¢ an hr became effective Dec. 1—a month before contract expiration date.

The existing contract is scheduled to expire Dec. 31. Notification of intention to negotiate a new agreement must be made 60 days in advance, with talks to begin not later than 30 days before expiration date.

One argument the steel workers would be likely to use in asking for an early contract meeting is that other industries covered by escalator clauses, notably the automobile industry, have given their workers cost-of-living increases right along this year. The steelworkers, of course, have not had a base pay boost in 1951.

In addition to a wage increase of perhaps 15¢ an hr, Mr. Murray is likely to ask for a more liberal pension system to compensate for higher living costs of retired workers, and improved hospitalization and sickness and accident benefits.

Copper Agreement—The union leader has never been in favor of an escalator clause because he feels that keeping up with living

costs is not enough—that wages of workers should rise faster than living costs. However, the apparent success of the plan in other industries may cause him to change his mind.

Whatever the final settlement in the copper industry dispute, it is bound to have an effect on the thinking of Mr. Murray regarding the needs of his steelworkers. Kennecott Copper Co., the largest producer, settled its strike with an increase of 15¢ an hr plus a pension plan costing about 4½¢ an hr. Other producers had not agreed to this at press time, although the workers were returning to their jobs under a court order in line with provisions of the Taft-Hartley Act.

Costs Have Risen—Success of the USW bid for an increase will depend on steel producers being assured a price increase. Steel producers already have grounds for a price boost on the basis of rises in other costs, notably



freight charges and raw materials. The average 5½ pct increase of last Dec. 1 reflected on higher employment costs. The did not reflect accumulated increases in material costs which that time amounted to about per ton in the case U. S. Steel.

Just over the horizon also is the expiration date of the USW contract with Aluminum Co. of America covering 15,000 workers in plants. This agreement expires Nov. 30, as does the AFL aluminum workers contract in plants employing 10,000. Last year Alcoa voluntarily gave its workers a 10 pct pay boost effective the first payroll week in October, adding fuel to the US case for a wage increase in steel.

Wheel Guards Safety Factor

Inexperienced labor entering defense work has made safety devices even more of a necessity. Recognition of this fact has led the Safety Committee, Grinding Wheel Institute, to urge the chief manufacturer of grinder wheel guards, Morrison Products, Inc., Cleveland, to push completion of its line. It has been standard practice for many years for portable tool manufacturers to equip their products with wheel guards, but Morrison Products estimates that over 70 pct of the guards are later lost or discarded through carelessness or ignorance.

Weirton Pays Insurance

Weirton Steel Co. employees will get another free insurance ride in October. The company has announced that employee contributions to insurance coverage will be waived for the second time this year. The two waivers represent a saving of \$100,000 to employees.

The waiver does not cover hospitalization benefits, for which employees pay from 36¢ to \$1.50 per month, depending on marital status and number of dependents.

Weirton twice waived insurance contributions last year—in January and December.

Four-Plant Pullman Strike Ended

Government mediators last week announced settlement of the month-old USWA strike at four plants of Pullman Standard Car Mfg. Co. A fifth plant, at Michigan City, Ind., was unaffected by the strike and produced a little over 1000 cars a month.

Total loss to the nation's freight car building program totals approximately 4000 cars. Normal output is expected late this week.

Steel Plants Win Safety Awards

The Distinguished Service to Safety Award made by the National Safety Council has been awarded to Truscon Steel Co. plants at Massillon and Youngstown, Ohio.

Massillon employees won the award by working nearly 9 million man-hours during 1950 with a frequency rate of only 1.78 accidents per million man-hours worked. Truscon employees at Youngstown worked nearly 4.73 million man-hours in 1950 at a rate of .63.

Will Phil Murray Retire?

Philip Murray's apparent decision to retire after serving one more 1-year term as CIO president, his job since 1940, will intensify jockeying of other prominent CIO personalities for the position.

Mr. Murray's reaction to the Washington report that he wanted to retire—this year, if possible—was a negative "No comment." Lack of a more positive statement left little doubt that he would step down.

The report is that the CIO leader, whose health has been something short of robust since last spring, asked his vice-presidents to select a successor for election at the CIO convention in New York Nov. 5. He agreed to be a candidate again because of the virtual impossibility of settling on another candidate before the convention. His re-election is a foregone conclusion.

Most prominently mentioned as a successor is the fiery Walter P. Reuther, head of the powerful United Automobile Workers Union. Other possibilities include James B. Carey, secretary-treasurer of the CIO and president of the Electrical Workers, and Allan S. Haywood, director of organization.

Mr. Murray will continue as president of the United Steelworkers of America, his first love and the foundation for his recognition as one of the country's great labor leaders. His success in welding and holding together the various unions in the CIO is another important achievement, although in 1949 and 1950 he was forced to maneuver the ousting of 11 unions whose policies tended to follow the Communist Party line.

Research

Castings Lab:

New facilities will test railroad equipment, ore car construction.

A new \$750,000 product development laboratory, part of a \$6 million expansion program, is now in the planning stage for the National Malleable and Steel Castings Co., of Cleveland. It is estimated that the engineering and testing lab will be the largest and most complete of its type when it begins operations late next summer.

Producers of equipment for passenger comfort and safety, and for the protection of freight, National is also a major supplier of mine cars used in mechanizing mine field operations. One of the first items to be studied will be rubber and friction-type draft gears. Tests will also be run on ingot, billet and ore cars used in the steel industry.

Included in the set-up will be a

1400-ft section of test track, part of which will be on an incline. Cars will be rolled down the slope into a stationary car at the bottom to determine impact and shock absorption. As the tracks will connect with regular railroad lines, test cars can easily be moved to any section of the country to check car designs.

Double Duty Gas Plant Opens

The Koppers-Hasche process gas plant recently put into production by the Rochester, N. Y., Gas & Electric Corp. is the first low-cost unit capable of both reforming natural gas and producing a gas to augment it. The plant can produce over 1 million cu ft of city gas a day in heat contents of from 300 Btu to 1050 Btu, using gasoline, propane, butane, light oil or natural gas as raw materials.

High conversion costs frequently

make it impractical for utilities to deliver straight natural gas even when available. The new unit can convert high Btu natural gas into a substantially greater volume of low Btu gas than can be produced by other processes. Contrariwise, in areas where natural gas is now in use, the process can deliver a gas of the same characteristics and heat content for periods of peak demand or if pipelines fail.

Chemical Applications — The plant is also being closely watched by chemical industries, since only slight modifications will make it an efficient synthetic producer of benzene, ethylene, and acetylene, all greatly in demand in the plastics and other industries. The manufacturer, Koppers Co., Inc., is currently negotiating for rights to build the plants for the manufacture of these and other chemicals.

BORON: Use in Steel Alloys Grows

Detroit SAE hears that boron steels may account for 15 to 20 pct of alloy steel output . . . Merits described in tech papers . . . Well past the experimental stages now—By Walter Patton.

Boron-treated steel may account for as much as 15 to 20 pct of alloy steel production in this country by the end of the year, members of the Detroit section of Society of Automotive Engineers were told at a meeting in White Sulphur Springs, W. Va., last week.

The new series of lean alloy steels developed especially to conserve alloying elements were de-

Technical details, including background, applications and heat treatment of boron steels, were reported in THE IRON AGE July 5, 12, 19 and 26 and Aug. 9. Reprints of this series will be available soon at a nominal charge.

scribed in detail for Detroit members of SAE by a panel of leading metallurgists, including M. T. Garwood, chief metallurgist, Chrysler Corp.; T. W. Merrill, chief metallurgist, Vanadium Corp.; Porter Wray, U. S. Steel Co.; and Roy Roush, Timken Detroit Axle Co. Harry T. Knowlton, chief metallurgist, International Harvester, also a member of the panel, was unable to attend the technical session which was a highlight of the 3-day meeting here.

Historical Background—The historical development of boron-containing additional agents for steel, available alloys and the percentages of boron needed to provide hardness penetration in steel were described by Mr. Merrill.

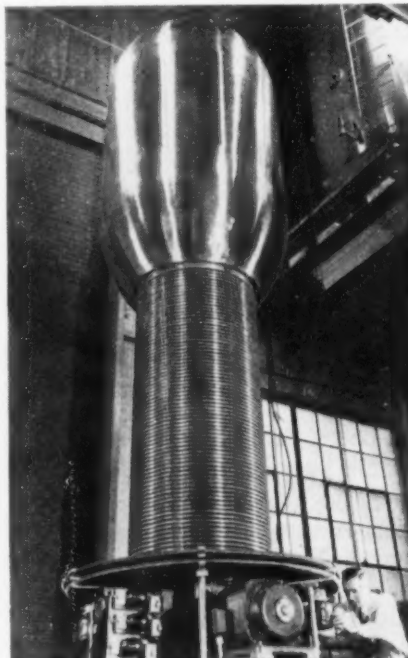
The speaker emphasized that only relatively small amounts of boron are needed and the usual chemical processes for determining boron content are generally unreliable. "Hardenability tests," he said, "provide the fastest and most satisfactory method for determining boron content."

Porter Wray told SAE members that approximately 410,000 ingot tons of boron-treated steels have been produced in this country since 1937 and that use of these steels is

growing rapidly. Production during the month of August was 21,000 ingot tons and September schedules of 35,000 tons will account for approximately 7 pct of all alloy production, he said.

"Boron steels are now well past the experimental stage," Wray said. "Acceptance of these steels by industry as well as many government agencies is now complete.

Low Cost—Timken-Detroit Axle Co. used some of the first heats of boron steel made in this country, according to Ray W. Roush, chief metallurgist. Starting with boron-treated axle shafts used during World War II, Timken has greatly expanded its use of boron-containing steels and has already produced more than 100,000 gear sets. This



FOOD SAVER: This high voltage Van de Graaf Accelerator bombards foods, drugs and other perishables. Canned perishables so irradiated can be kept at room temperatures for as long as 4 years. Designed by High Voltage Engineering Corp., the terminal cap is Armco Stainless Steel, fabricated by Spincraft, Inc., Milwaukee.

includes large size, heavy duty truck gears which are very highly stressed in service. Roush said boron steels have been satisfactory from the standpoint of response to forging heat treatment, minimum distortion, machining and tool life. The fatigue properties are comparable to other alloy grades having the same hardenability.

Garwood explained that although the cost of boron-type steels is slightly higher than some of the leanest alloy grades used by the automobile industry, boron steels that will replace the higher alloy steels will cost less than many of the steels now being used.

Careful Treating Needed—During the discussion it was emphasized that close control during heat treatment is required to get the best results from these steels in production. Boron steels must be used in the quenched and tempered condition to derive the deep hardening benefits they offer the steel user at favorable cost.

Aircraft:

Consolidated building airframe to house atomic-powered engine.

Consolidated Vultee Aircraft Corp., San Diego, will build a prototype airframe to house an atomic power plant, under Air Force contract, while General Electric continues its development of the airborne nuclear-energy engine.

Air Force announcement of the airframe contract followed by about 2 weeks the Navy's statement that Electric Boat Co. is building the hull for an atomic-powered submarine. Also, the recent announcement coincided with news that the Atomic Energy Commission had granted GE a 5-year renewal of the contracts under which the electric firm operates the Hanford, Wash., plutonium plant and the Knolls Atomic Power Laboratory, Schenectady, N.Y.

Prior to the disclosures, Fairchild Airplane and Engine Co. turned over to the Air Force and Navy the results of a 4-year study on atomic propulsion. Fairchild conducted its work at Oak Ridge, Tenn.

ROADS: Building Plans Hit Bump

Steel request slashed 57 pct . . . Pace of highway projects will slacken . . . Slowup comes at a time of defense need . . .

Rising costs upset construction budgets—By Gene Beaudet.

Plans for smoother riding along the nation's highways hit a road block last week when the Defense Production Administration slashed fourth quarter structural steel requirements of the Bureau of Public Roads by 57 pct.

The bureau, which had carefully screened its requirements to include only military access roads, sections of the interstate highway system and those inadequate and unsafe for traffic volume, received 100,000 of the 232,792 tons it had requested.

The cutback, according to DPA Administrator Manly Fleishmann, was due to the fact that structural steel requirements during the fourth quarter came to 23 pct of the available supply. After direct military, atomic energy, and aluminum expansion construction programs were met, other allotments had to be reduced proportionately.

This situation will continue through the first quarter of 1952 when demand is expected to total 200 pct of the structurals which are produced.

Highway Tieup — Because of the reduction, hundreds of important road construction and expressway projects are expected to further slacken their pace. It has already been slowed by the steel shortage. Structurals which are used mainly for bridges have been the chief bottleneck but reinforcing steel is also expected to be in shorter supply.

In some cases black top surfaces can be applied in place of concrete but there can be no substitute for structurals. Maintenance and construction will also be curtailed because of the lack of adequate road machinery, resulting from the short steel supply.

This slowdown in highway construction comes at a time when improved roads are needed more than ever before. Highway conditions throughout the country are generally conceded to be deplorable and have been for some years.

It is estimated that prior to 1941 roads were wearing out at a rate five times faster than they were being rebuilt. Today this figure has undoubtedly gone up because construction was low during World War II and because there are 15 million more motor vehicles on the roads now than were in operation in 1941.

More Congestion—Further deterioration of the country's highways and the stalling of huge expressway projects by some states will increase congestion on already overcrowded roads. Efficient distribution of products to and from the nation's production lines and transportation of millions of working people will be hampered.

Truck shipments carrying heavier loads and traveling greater

distances are increasing every year. The number of motor trucks and trailers on the roads has increased from about 5.7 million in 1946 to well over 8 million. These carriers haul over 90 billion ton-miles of products yearly. For the first quarter of 1951 the tonnage transported by motor carriers totaled 45.9 million tons.

To cope with the problem, state highway departments have been increasing road expenditures steadily since the war. However, budgets are continually being upset by rising construction costs. The Bureau of Public Roads composite mile index, which is a construction cost yardstick against a 1925-1929 base, came to 159.7 in the first quarter of 1951 as compared with 140.7 in the same period last year.

Rising Costs—The estimated \$2.08 billion the states will spend on the roads this year is a new high but will result in less new highway mileage than the smaller amount spent last year. Of this \$2.08 billion, about \$1.58 billion was slated for the construction of 49,774 new miles of highway and the rest for maintenance.

Last year 50,418 miles of new highways were built at a cost of \$1.4 billion. Total expenditures for 1950 came to \$1.86 billion yet only half the job will be done.



IN A HURRY: This 9-in. production lathe is being loaded at Boston for air delivery to Cleveland. It was urgently needed for defense work. Made by Reid Bros. Co., Beverly, Mass., the machine weighs almost 3 tons.

NPA: Shortages Force Its Hand

Standardizing of metal products may be next . . . Fleischman opposed, but possibly no choice . . . M-83 is clue . . . Voluntary standards prepared . . . Standard construction practices code.

More standardization orders which would limit the types of metal items to be produced may be in the offing.

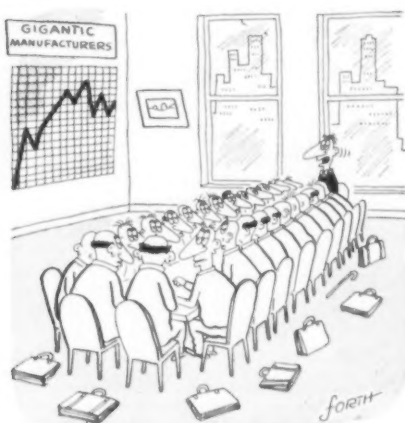
Controls Chief Manly Fleischman is personally opposed to such types of order, partly because it puts a damper on business ingenuity.

But continued shortages, particularly copper, have backed NPA into a corner where it must consider orders of this type. Tip-off is the recent order (M-83) which in effect suspends production of some 80 types of jacks.

Meanwhile, Defense Mobilizer Wilson is backing a program by which the 17 government agencies connected with the defense program are drawing up standards.

In connection with this program, NPA has approved and is recommending a set of standard design practices—assembled by its Facilities & Construction Bureau—for use by architects and engineers.

More for Military—In the meantime, military and defense requirements are increasing. Fourth quarter Dept. of Defense use of copper products, for instance, is scheduled at 205,000,000 lb, an increase of roughly 20,000,000 lb from third quarter.



"Can anyone beat a pair of jacks and kings?"

This means that brunt of the impact must fall on producers of civilian lines who are already limited to no more than 54 pct of 1950.

Meanwhile, Defense Production Administration officials are quietly working to get the ceiling price raised by at least 3¢ per lb above the present 24½¢.

This, they say, would at least allow the United States to compete on the world market.

Tungsten Carbide Prices Catch Up

A government order, CPR 71, effective Sept. 10, permitting a 17 pct price rise in sintered tungsten carbide products affects only those producers caught with their prices down at the time of the big freeze last Jan. 26. These include Firth Sterling Steel & Carbide Corp. and Allegheny Ludlum Steel Corp. Not affected are such producers as Kennametal, Carboloy, and Vascoloy, who increased their prices before the freeze. The order brings prices of all producers to a common level.

Aluminum Needs Self-Certified

Steel plants and other users of aluminum for "destructive" purposes will be permitted to obtain fourth quarter supplies under self-certification as provided in a new materials order, M-84.

Purposes for which allowed and their symbols are: Steel deoxidizing, X7-1; reduction of ferroalloys, X7-2; thermit for welding, X7-3; copper base alloys, X7-4; Alnico and nickel alloys, X7-5; magnesium base alloys, X7-6; zinc base alloys and for galvanizing bath, X7-7; anhydrous aluminum chloride, X7-8; and chemical reactions, X7-9.

The order permits use of 0.6 lb grade-4 deoxidizing ingot for each ton of carbon steel a month or 2

lb for each ton of alloy steel or 2.5 lb for each steel casting.

Ferroalloy producers also are limited in such aluminum use for furnace charges to the average use during January, 1950.

Give No More Tax Aid

Fluxstone, limestone, dead-burned dolomite, magnesite and magnesium oxide have been removed from the list of materials for which the government will make loans, grant tax-amortization certificates, or give other types of production assistance.

Defense Minerals Administration says the reason is that foreseeable supplies over the next 4 or 5 years will equal or exceed estimated demand.

Oilmen Must File Casing Bids

Applications for priorities—aid in obtaining casing and tubing for first quarter 1952—must be filed by oil and gas operators by Sept. 30.

Inventory reports showing casing and tubing in stock as of Sept. 20 also must be submitted. Operators who drill 40 wells or fewer annually must file reports showing how many were completed during the third quarter and how they used casing and tubing allotments.

Industry Controls This Week:

NPA Orders

M-1, Direction 4, and CMP Reg. 4, Direction 3—Due to be issued shortly. Extend to Sept. 25 cut-off date by which unrated orders for steel, aluminum and copper must be converted to authorized controlled materials.

M-83—Limits jack manufacture.

M-84—Allows users of aluminum for "destructive" purposes to obtain fourth quarter supplies under self-certification.

OPS Orders

CPR 1, Revision—Increases manufacturers' prices on passenger cars.

CPR 60—Effective date postponed until Oct. 1.

CPR 71—Equalizes tungsten carbide prices.

NPA Curtails Jack Production

Production of mechanical, hydraulic and other types of jacks have been placed under strict limitations through M-83 issued by National Production Authority last week.

Listed in the order are 21 items which permitted lift capacities, number of models, sizes per model, and closed height specifications. Also listed are 28 items which may be produced without restrictions. But the net effect of the order will be to suspend manufacture of about 80 models and sizes now being produced.

Production is banned for any items not listed in the order. Some 20,000 tons of steel is expected to be saved annually through application of the order.

Brass Products Pricing Change

Pricing practices for resellers of brass mill products are undergoing some changes. Office of Price Stabilization has placed resale quotations on these items under Ceiling Price Reg. 67. Previously brass mill products were resold under the General Ceiling Price Reg.

A reseller now will deduct the discount, if any, from the manufacturer's published list price, or add the percentage markup he applied during the period Apr. 1-June 24, 1950. The result is his new ceiling price. If no list price was used, the reseller adds to his

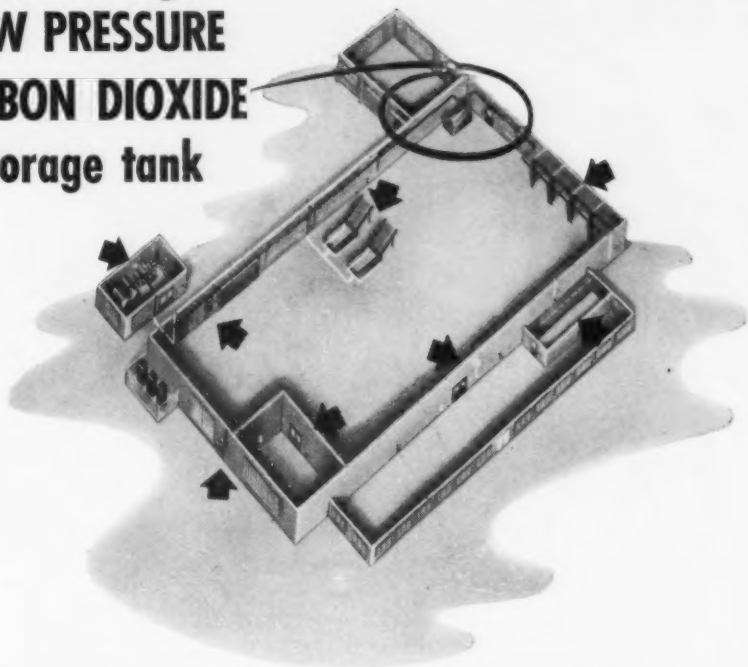
CMP Construction Deadline

All applicants for advance allotments of controlled materials for first quarter 1952 construction and succeeding quarters must file their CMP 4C forms not later than Sept. 20.

Applicants who were not given fourth quarter 1951 allotments are being notified that they should re-apply by filing these CMP 4C forms before the Sept. 20 deadline.

Plant-Wide Fire Protection

from a single
**LOW PRESSURE
CARBON DIOXIDE
storage tank**



Now, your larger size fire hazards can be protected more efficiently at less cost, thanks to C-O-TWO Low Pressure Carbon Dioxide Type Fire Extinguishing Systems. Simple piping, running from one centrally located storage tank, instantly transports clean, non-damaging, non-conducting carbon dioxide anywhere in the plant area . . . to flammable liquids, electrical equipment, storage spaces, manufacturing processes and record vaults. Fire at any protected location is extinguished in seconds with an absolute minimum of expense and interruption.

Flexibility is the keynote of these new type C-O-TWO Fire Extinguishing Systems . . . the low pressure carbon dioxide storage tanks range in capacities from one to fifty tons . . . discharge facilities can either be manual mechanical, manual electric, automatic mechanical, automatic electric or a combination of these . . . especially installed to fit your particular needs. Future plant expansion is easily and

economically provided for by initially installing an oversized low pressure carbon dioxide storage tank and adding the supplementary discharge facilities at a later date.

C-O-TWO Low Pressure Carbon Dioxide Type Fire Extinguishing Systems are built with the same superior design and high quality workmanship that have characterized C-O-TWO High Pressure Carbon Dioxide Type Fire Extinguishing Systems for many years. Whether it's fire detecting or fire extinguishing . . . portables or built-in systems . . . C-O-TWO means experienced engineering that assures you of the best type equipment for the particular fire hazard concerned.

So, with current expensive delayed replacements, why not let an expert C-O-TWO Fire Protection Engineer help you now in planning fully approved fire protection facilities for your various properties. Complete free information and descriptive literature is yours for the asking. Get the facts today!



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The HEVI DUTY Tool Room Combination



Hevi Duty Tool Room Combination installed in the plant of a large pump manufacturer.

for Precision Heat Treating of Tools and Dies

This Hevi Duty combination is a complete, low cost heat treating unit for tool rooms and small manufacturers. The "Temperite," air draw tempering furnace, "Treet-All," multipurpose furnace, and "Alloy 10," high temperature furnace, provide temperatures from 250° F to 2350° F. Prepared atmospheres are supplied by the "Atmo-Gen." Furnaces and the "Atmo-Gen" are available separately.

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Controls

current legal cost the percentage markup used in the period cited.

Products affected include new plates, sheets, strips, rods, bars, tubes, pipes, extrusions, anodes or other shapes made from copper or copper base alloy. Non-electrical wire made from copper base alloy and welding rods of copper or alloy also are included.

Drop "D" from Top List

Allotment symbol "D" has been dropped from the top priority list (A through E) for acceptance of Authorized Controlled - Materials orders. Steel, copper, and aluminum producers will now take "D" orders on the same basis as ACM orders for civilian production.

In a similar action, National Production Authority eliminated all ratings for all overseas shipments of petroleum goods except W-4 for controlled materials and DOW-4 for noncontrolled goods.

Tools Now Need Export OK

Several types of tools and transportation equipment have been added to the list of items which may not be exported against DL project licenses without approval by the Office of International Trade.

Included are locomotives and parts, aircraft training and maintenance, railway cars and parts, tungsten carbide metal cutting tools and blanks and tungsten carbide type of detachable rock drill bits.

Automakers Get Price Increases

Manufacturers' prices in the passenger car field were increased an average 5 to 6 pct, in keeping with the revision of Office of Price Stabilization's CPR 1.

This revision, giving passenger car builders the same pricing leeway as machinery manufacturers and others, takes into account costs increases after June 24, 1950. As OPS sees it, the 3½ pct increase allowed auto manufactur-

ers on Mar. 1 only partially offset cost increases.

Now carmakers will use a price increase adjustment factor in computing ceiling figures. This factor is reached by adding allowable increased costs to the base period price and dividing the result by the car's current price.

Ultimate cost to the car-owner will be calculated soon. OPS is drafting a retailers' regulation, based on application of dealers' margins to the increase in manufacturers' ceilings.

Steel for Oil-Producing Areas

Steel industry will be asked to supply a minimum of 11,000,000 tons of products to meet 1952 requirements for the oil and gas industry, both domestic and foreign.

It is understood that Petroleum Administration for Defense has already put in a request to DPA for close to 9.9 million tons. Requirements to be filed later will include at least 800,000 tons of additional plate and supplemental amounts for oil country tubular goods. Included in the preliminary requests are more than 660,000 tons of alloy and 18,000 tons of stainless.

More than 300,000 tons of the total to be set aside for foreign requirements are slated for export to Canada.

CPR 60 Enforcement Postponed

Metal castings producers may postpone until Oct. 1 applying CPR 60 to their products. They may elect to price under the regulation at an earlier date, if they wish. Originally, Office of Price Stabilization had set Sept. 1 for instituting the regulation. Officials discovered, however, that many producers were unable to complete pricing computations by that date.

Moreover, until Aug. 13, producers of aluminum castings were paying well above ceiling prices for secondary ingot. Since CPR 60 was drafted on the basis of



Torrington 4-housing Swinging Coiler installed by the Miller Co., Meriden, Conn.

For coiling the thick gauges and the hard alloys of phosphor bronze and other non-ferrous alloys, the Miller Company prefers their Torrington 4-housing Swinging Coiler. Delivering tight coils, taking the toughest metals within its range, this coiler gives dependable, trouble-free service.

FEATURES OF TORRINGTON 4-HOUSING SWINGING COILER

Designed for .100" to .325" gauges, non-ferrous metals

Cartridge-type coiling roll boxes for easy roll removal

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Kick-off and tailing mechanism

Motorized traverse to track with mill roll face

Readily swung to non-operating position

Parallel adjustment of top coiling rolls

Double helical steel gears running in oil

Torrington manufactures a wide range of 2- and 4-housing coilers in portable, stationary, sliding and swinging models. Torrington skill, knowledge and experience, gained from years of close collaboration with metal mills, is available to you in selecting or adapting the correct model for your specific problem.

Call or write Torrington for information and name of nearest Torrington representative.

The TORRINGTON

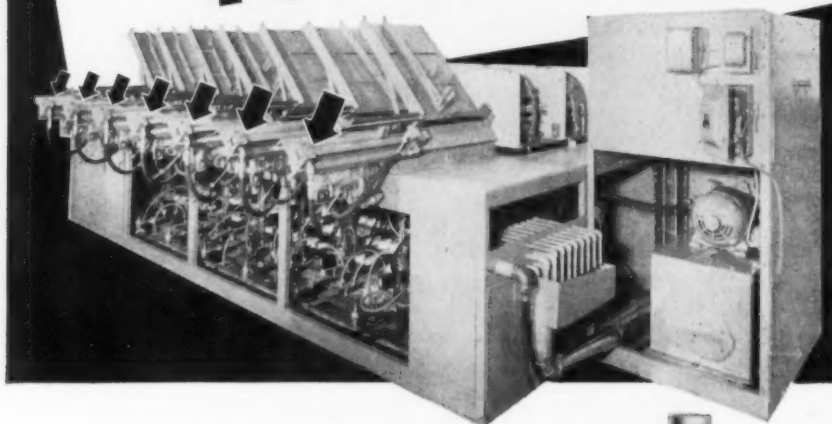
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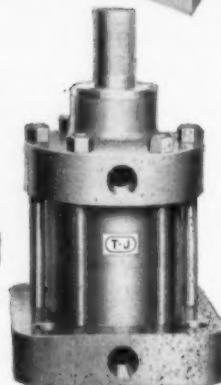
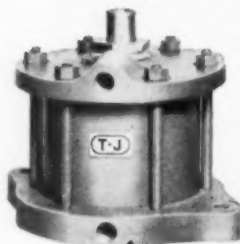
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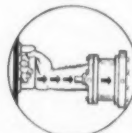
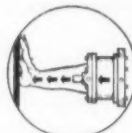
T-J Hydraulic Cylinders furnish efficient, automatic "push power" for feeding devices in this new Ajax-Northrup induction forge heating equipment.

This unit—manufactured by Ajax Electrothermic Corp., Trenton, N. J.—automatically heats steel forging stock in sizes ranging from 1 to 4 inches (rounds or squares) at 2250°F. at rate of 7500 to 8500 lbs. per hour. Has space for 8 heating stations . . . each with *hydraulically operated billet feeding devices employing T-J Cylinders*. These cylinders also eject heated bars automatically. Induction heating with this equipment results in uniformity of successive billets fed to the forge—thus controlling quality of finished forgings and reducing rejects.

Do you have a tough job in power movement—pushing, pulling or lifting? Let T-J help you *simplify machines, save labor and cut costs* by using T-J Air or Hydraulic Cylinders! Many standard sizes and styles . . . cushioned or non-cushioned . . . 100 lb. or 50,000 lb. Precision-built, long life. Write for more information. The Tomkins - Johnson Co., Jackson, Mich.



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IN ANY DIRECTION



100 LBS. or
50,000 LBS.

35 YEARS EXPERIENCE

TOMKINS-JOHNSON

RIVETORS. AIR AND HYDRAULIC CYLINDERS. CUTTERS. CLINCHERS



Controls

ceiling figures, some producers need additional time to allow for high-cost inventories before rolling back their ceiling prices.

OPS Studies Nut and Bolt CPR

A proposed regulation applying only to bolts, nuts, solid rivets, and screws would establish ceiling prices for these items on the basis of published list prices in effect on Jan. 25, 1951.

Metals Branch personnel at the Office of Price Stabilization have such a regulation under study, after the third in a series of meetings with industry advisers. Recommendations have been incorporated into the tentative draft.

Coke Division Consultant

Ray T. Patton, vice-president of Republic Coal & Coke Co., of Chicago, has been appointed consultant in the coke division of the Defense Solid Fuels Administration. Prior to his association with Republic in 1942, Patton had been vice-president of the North American Coal Corp.

Integrated Plants:

OPS amendments provide new basis for figuring net materials costs.

Manufacturers operating integrated plants can apply now to Office of Price Stabilization for an appropriate cost-increase factor to eliminate some disparities in figuring materials costs.

By amending the general manufacturers' order (CPR 22) and the machinery order (CPR 30), OPS has provided a basis for figuring the change in net cost of a manufacturing material produced in one plant and transferred to another plant of the same company.

Previously, regulations required the cost differential to be measured by the difference between the manufacturer's base period price and his current ceiling price. As this worked out, a non-integrated producer was able to use a lower base period cost than the integrated manufacturer and compute a larger cost change for materials.

Subcontracting

Will Advise on Small Business

Advice on small business matters will be furnished the nation's price-makers by Leo H. McCormick, former Baltimore businessman.

Michael V. DiSalle, head of the Office of Price Stabilization, has named McCormick to serve as chairman of the Intra-Agency Advisory Committee for Small Business Affairs, to represent the agency on the Inter-Agency Small Business Executives' Committee, and represent the price chief before the Select Small Business Committees of the House and Senate.

Another Subcontracting Exhibit

A prime contractor's exhibit for small businessmen in the Michigan area will be held Oct. 30 to Nov. 2 in the Agricultural Building, Michigan State Fair Grounds, Detroit.

Numerous displays of parts and equipment available for subcontracting will be presented. Most of the exhibits will come from the hard metals industries, but other fields will also be represented.

Atomic Security Confab Scheduled

Security problems arising from protection of information related to atomic energy production will be discussed in Washington on Sept. 14, 15, and 16 by representatives of the United States, United Kingdom, and Canada.

Delegates will use a uniform declassification guide in determining what information resulting from atomic energy research and development may be published, and what may not.

Subcontractors Help Make Tank

More than 1500 sub-contractors, some with fewer than 300 employees, are producing parts for the Army's newest medium tank, now coming off the assembly lines at American Locomotive Co.'s Schenectady ordnance plant. These tanks are the first of the new model, the improved General Patton, to be

Kester Solder



Kester engineers, with over 100,000 different types and sizes of solder available, will specify the right flux-core solder that will give maximum efficiency and economy to the job.

Easier to Use

Using the most suitable solder for each operation will enable solderers to work at top speed without sacrificing quality. Waste is eliminated and rejects are held to a minimum.

Top Quality

Kester Solders are made only from newly mined grade A tin and virgin lead. Fluxes—chemically and scientifically correct.

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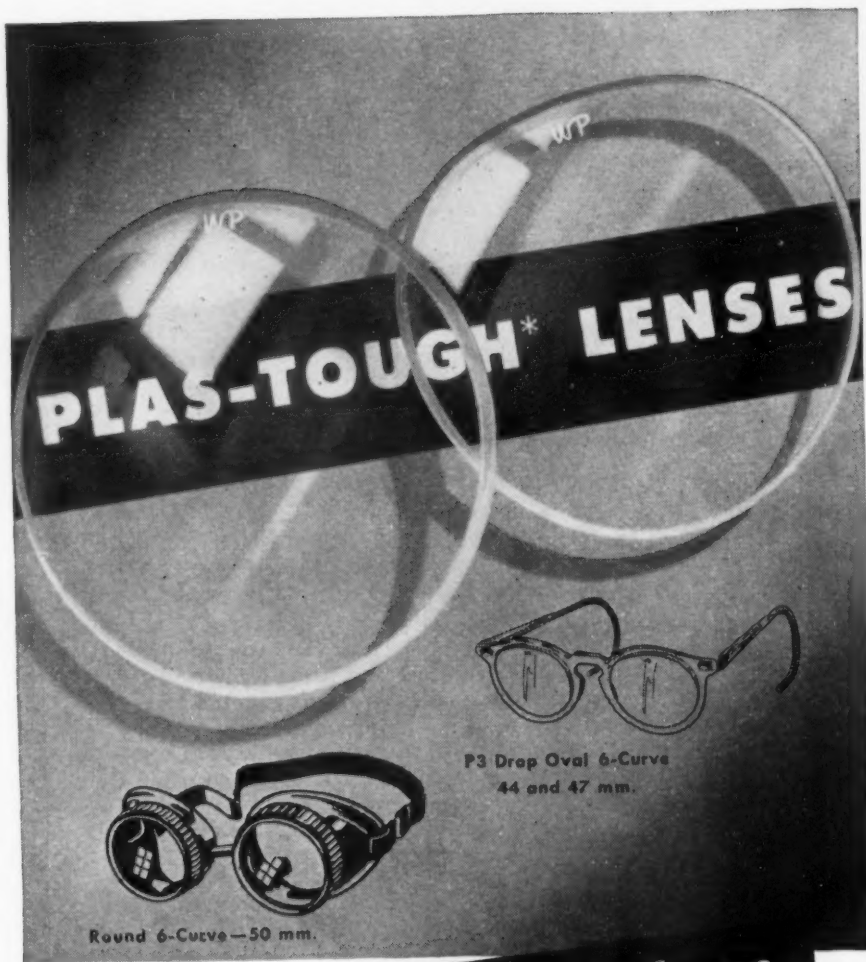
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"SOLDER and
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 Dependable Products Since 1870

*Trade-Mark

Subcontracting

produced by private industry. Heretofore they have been made at the Army's Detroit Arsenal.

Equipped with greater firepower, including a 90mm gun, increased horsepower and heavier armor, the new weapon is one of the most rugged ever produced.

Defense Needs First on RFC Loans

Ryan Industries, Inc., of Detroit, is expected to produce additional specialized defense materials for the Air Force through use of a \$600,000 Reconstruction Finance Corp. loan.

Air Force guaranteed the loan to the 250-employee concern, which has produced almost \$5 million worth of equipment for USAF in the past 3 years.

RFC has turned down a standard-type business loan of \$60,676,638 to the Copper Range Co., which sought funds to develop ore deposits in Michigan. The agency has relayed the application to Defense Minerals Administration, which will determine whether Copper Range can qualify for a loan.

To Build Navy Oilers

First of a series of fleet oilers will be built for the Navy at Bethlehem Steel's Quincy, Mass., shipyard, with contracts for five additional oilers scheduled for assignment on a competitive bid basis.

Bethlehem's yard will act as design agent. Hull No. AO 143, to be built there, will serve as the prototype for the other vessels.

Cost figures on this portion of the 1952 construction and conversion program will remain confidential until all contracts have been awarded, the Bureau of Ships said.

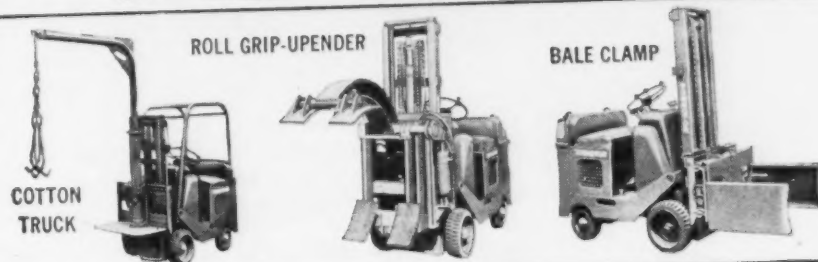
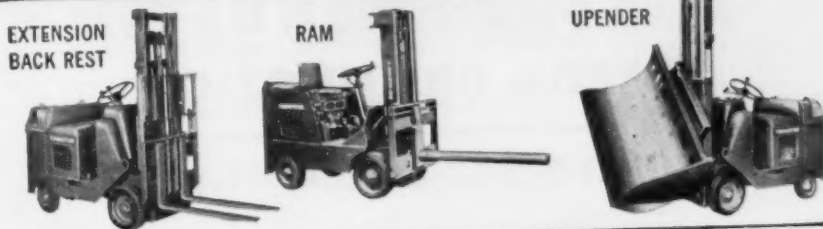
Yard Leased for Boiler Contracts

Babcock and Wilcox Co. expects to employ "several hundred men" in filling ship boiler contracts at a portion of its Wilmington, N.C., reserve shipyard. The firm recently leased part of the yard's north section from the Maritime Administration.

Defense Contracts—

Week of September 3, 1951

Tank parts—Gar Wood Industries, Wayne, Mich.
 Pump parts—Morris Machine Works, Baldwinville, N. Y.
 Crapshooters—Davis Engineering Corp., Elizabeth, N. J.
 Lifeboats—Lane Lifeboat & Davit Corp., Brooklyn
 Lifeboats—Marine Safety Equipment Corp., Point Pleasant, N. J.
 Floodlight—Griffin Wellpoint Corp., New York
 Crushing & screening plant—Universal Engineering Corp., Cedar Rapids, Iowa
 Floodlight—Toro Mfg. Corp., Minneapolis
 Road grader—Adams Mfg. Co., Indianapolis
 Road sweeper—Wayne Mfg. Co., Pomona, Calif.
 Spare parts—Bucyrus-Erie Co., South Milwaukee
 Spare parts—Iowa Mfg. Co., Cedar Rapids, Iowa
 Anchor shackles—Upson-Walton Co., Cleveland
 Maintenance parts—Titeflex, Inc., Newark, N. J.
 Armament parts—Nobles Engineering & Mfg. Co., St. Paul, Minn.
 Gage indicators—Modern Tool & Die Co., Philadelphia
 Breech ring forgings—Standard Steel Works Div., Burnham, Pa.
 Alignment kits—Raytheon Mfg. Co., Waltham, Mass.
 Power supply—Fada Radio Corp., Belleville, N. J.
 Motor generators—Electro-Engineering Products Co., Chicago
 Interphone equipment—Telectro Industries Corp., Long Island City, N. Y.
 Electric generators—Elliott Company, Washington
 Engine—General Motors Corp., Cleveland
 Gaging machine—Electric Eye Equipment Co., Danville, Ill.
 Heat unit—General Electric Co., Chicago
 Milling machine—Stedfast & Roulston, Inc., Boston
 Machine—Cosa Corp., New York
 Tools and equipment—Congoleum-Nairn Co., Inc., Kearny, N. J.
 Rocket container—West Bend Aluminum Co., West Bend, Wis.
 Spherical floats—National Steel Construction Co., Seattle
 Rocket motors—McCord Corp., Detroit
 Motor—Servo-Tek Products Co., Inc., Paterson, N. J.
 Torpedo control—Francis Metal Products Corp., Palmyra, N. Y.
 Screws and bolts—Buffalo Bolt Co., North Tonawanda, N. Y.
 Rifle—Itasca Gun Co., Ithaca, N. Y.
 Locker—Ace Utilities, Inc., Brooklyn
 Repair parts—Dravo Corp., Philadelphia
 Repair parts—General Electric Co., Philadelphia
 Exhaust mufflers—Maxim Silencer Co., Hartford, Conn.
 Control parts—Westinghouse Electric Corp., Philadelphia
 Switch parts—Ward Leonard Electric Co., Philadelphia
 Pump parts—Kinney Mfg. Co., Boston
 Repair parts—Mine Safety Appliance Co., Pittsburgh
 Repair parts—York Electric & Machine Co., York, Pa.
 Repair parts—Weston Electrical Instrument Corp., Newark, N. J.
 Repair parts—Diamond Power Specialty Corp., Lancaster, Ohio
 Motors and parts—Star-Kimble Motor Div., Miehle Printing Press & Mfg. Co., Bloomfield, N. J.
 Repair parts—Sperry Gyroscope Co., Great Neck, N. Y.
 Hoisting unit—Dempster Bros., Knoxville, Tenn.
 Roller, road—Huber Mfg. Co., Marion, Ohio
 Roller, road—Gallion Iron Works & Mfg. Co., Gallion, Ohio
 Engine parts—Cummins Engine Co., Columbus, Ind.
 Engine parts—Thew Shovel Co., Elyria, Ohio
 Dial system—North Electric Mfg. Co., Gallion, Ohio
 Control box—Radio Television Corp., New Brunswick, N. J.
 Spare parts—Aeroli Products Co., Hackensack, N. J.
 Control equipment—Radio Corp. of America, Camden, N. J.



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**WE'LL BET ONE OF THESE
 TOWMOTOR ACCESSORIES
 CAN HELP SOLVE IT!***



*** IF NOT—
 TOWMOTOR
 SPECIAL ENGINEERING
 WILL DEVELOP
 THE ANSWER!**

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HOW MANY PEOPLE HAVE YOU TALKED TO ABOUT AMERICANISM TODAY?

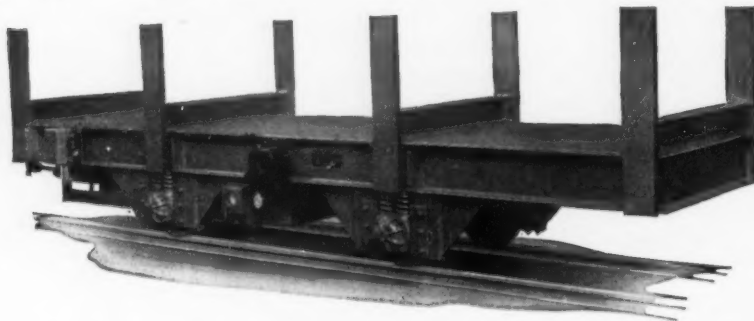


ATLAS

INTERPLANT HAULAGE EQUIPMENT

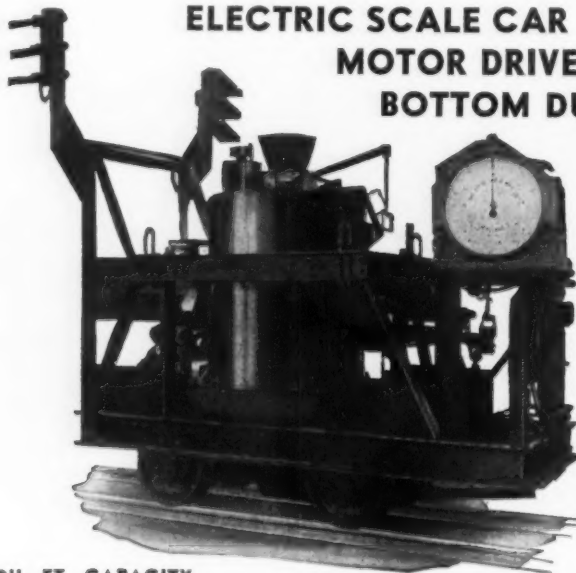
SPEEDS PRODUCTION

10 TON STORAGE BATTERY FLAT CAR



Built for handling pipe and conduit. Powered by storage battery. Geared to travel at walking speed when controller is held in operating position. Automatic "shut-off" and brake applied when spring return handle of the controller is released.

ELECTRIC SCALE CAR MOTOR DRIVEN BOTTOM DUMP



36 CU. FT. CAPACITY

For use in chemical plants. Cylindrical type body with dust filter. Mounted on Atlas Scale with 24" Atlas Dial and type-printing recorder. Car equipped with brakes, levers for operating discharge and loading chutes.

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ENGINEERS MANUFACTURERS

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—Steel Construction—

Fabricated Steel Awards this week include the following:

- 3800 Tons, Champion, Colo., Bureau of Reclamation. Pen stocks for Poudre and Mfg. Co.
- 1703 Tons, Cranford, N. J. Highway bridge for New Jersey State Highway Dept., Franklin Contracting Co. Low bidder.
- 925 Tons, Cumberland and York Counties, Pa., bridge for Pennsylvania State Dept. of Highways, Central Pa. Quarry & Stripping Construction Co. general contractors, to Bethlehem Steel Co., Bethlehem, Pa.
- 835 Tons, Cedar Rapids, Iowa, Lincoln County bridge project FN887, to Allied Structural Steel Companies.
- 573 Tons, Trenton, N. J. Four bridges on Route 26, Extension Sect. 2C for New Jersey State Highway Dept. Union Building Co., Passaic, N. J. Low bidder.
- 280 Tons, Cook County, Ill., Congress Street Expressway section 1F-2, to Bethlehem Steel Co.
- 250 Tons, Dunn County, Wis., Bridge Project T-072/5/, to Bethlehem Steel Co.
- 135 Tons, Jasper County, Iowa, Bridge Project 2054, to Pittsburgh - Des Moines Steel Co.
- 100 Tons, Campbells, Ind., Substation for Indiana Power and Light Co., to American Bridge Co.

Fabricated Steel Inquiries this week include the following:

- 626 Tons, Leominster and Lancaster, Mass., Bituminous concrete and five steel stringer bridges, Martin J. Dalton, Worcester, Mass., district engineer. Completion date, Dec. 15, 1952.
- 258 Tons, Montgomery, Vermont, Three span W F beam bridges with approaches, grading and a double track coat of tar with pea stone seal.
- 150 Tons, Camden, N. J., addition to Camden Station of Pennsylvania Railroad. Bids due Sept. 11.
- 145 Tons, Chester County, Pa., one I-beam bridge, construction of crushed stone base. Department of Highways, Harrisburg, Pa. Bids due Sept. 14.

Reinforcing Bar Awards this week include the following:

- 815 Tons, Bradley, Ill., Armour & Co. Research Laboratory, to Joseph T. Ryerson and Sons.
- 750 Tons, Boston, Mass., Boston connection to Boston Central Artery substructure and approaches. Completion date Dec. 31, 1953. V. Barletta Co., Roslindale, low bidder.

Reinforcing Bar Inquiries this week include the following:

- 245 Tons, Leominster and Lancaster, Mass., Bituminous concrete and five steel stringer bridges, Martin J. Dalton, Worcester, Mass., district engineer. Completion date, Dec. 15, 1952.

Building Up Despite Obstacles

Expenditures for new construction during 1951 will equal or exceed 1950 dollar volume although hampered by materials shortages and governmental restrictions.

This is evident in figures released last week by the Bureau of Labor Statistics. They show the dollar volume for the first 8 months 1951 at \$19.5 billion. This is \$2 billion ahead of 1950.

Industrial construction has set the pace, doubling from \$600 million for the period in 1950 to \$1.2 billion.

CMP Quiz:

Construction questions and answers listed by NPA in simple form.

The National Production Authority has issued a set of 44 questions and answers on construction under the Controlled Materials Plan. The following are included:

Q. How does the Controlled Materials Plan affect building projects?

A. All building projects are subject to the Controlled Materials Plan, as of the fourth quarter of 1951, except those not requiring use of the three controlled materials, steel, copper and aluminum.

Q. Is permission to build a home necessary?

A. Permission to build a home is not necessary where less than a specified amount of controlled materials is used. However, for more than the amount specified by the Government, permission must be secured.

Q. Is permission to build difficult to obtain?

A. Permission to build is not required for construction of any kind using no more than stated minimum amounts of controlled materials. For construction using larger amounts, authorization is made subject to structural needs and the availability of materials in each quarter of the year.

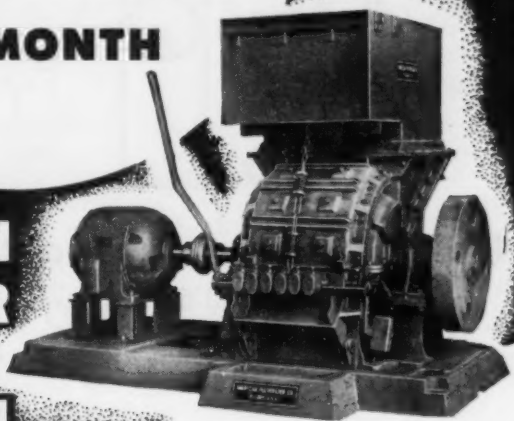
Q. When construction is under way in industrial projects and controlled materials are needed, how does the builder obtain his materials?

A. The builder files his application for additional controlled materials with NPA or the appropriate Government agency through which he receives his authorization and allotment for materials.

Q. Can anyone build a commercial structure, such as a store, a

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PER MONTH**

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TURNINGS CRUSHER
can bring you
NEW PROFITS!**



AMERICAN #2400
METAL TURNINGS CRUSHER

A chip salvage system, with an American Metal Turnings Crusher at the core, can help you realize new savings and profits in metal, oil, man-hours, factory space, and tool maintenance. Consider these typical money-saving, money-making advantages of an American installation:

- (1) Brings \$3 to \$4 more per ton for chips than for long machine shop turnings,
- (2) Reclaims 30 to 50 gallons of cutting oil per ton,
- (3) Prolongs tool life through more liberal use of recovered oil,
- (4) Saves 75% storage space . . . permits heavier freight car loads . . . cuts shipping costs,
- (5) Easier, faster handling,
- (6) Easier briquetting, so essential for foundry and steel mill use.

THIS COULD BE YOUR PROFIT STORY FOR NEXT YEAR!

240 Tons Metal Turnings Per Year \$ 960.00 Per Year
(20 tons per month at \$4 extra per ton)

3600 Gallons Cutting Oil Recovery at 30¢ Per Gallon . \$1,080.00 Per Year
(30 gallons per ton x 240 tons = 7200 gallons.
Half of this, 3600 gallons, can be credited to use
of chips instead of long turnings.)

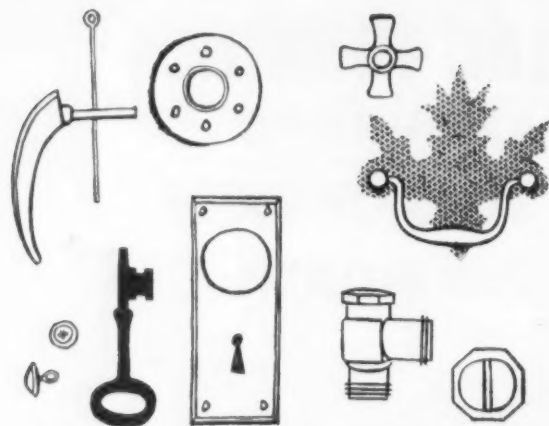
Estimated Savings on Manpower, Storage, Tool Maintenance, Freight, etc. \$ 300.00 Per Year

TOTAL GROSS PROFIT
(Resulting from an American Installation) \$2,340.00 Per Year

American PULVERIZER COMPANY
Originators and Manufacturers of
Ring Crushers and Pulverizers
WRITE for American Rolling Ring
Metal Turnings Crusher Bulletin.
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SAVE TIME AND DOLLARS!

BARREL FINISH YOUR METAL PARTS



Use the Correct Wyandotte Compound

More and more metal-finishing plants are realizing the advantages and economies of barrel finishing. And they find that when they use Wyandotte compounds, they obtain outstanding results.

Because in barrel finishing, the selection of the proper compound is just as important as choosing the correct type and size medium—or as controlling operating conditions.

The compound must suit both the work and the medium. It must take care of hard water conditions, keep media and barrels clean. And, of course, it must develop the desired finish on metal parts.

Wyandotte research and technical experience have developed barrel-finishing compounds which are widely accepted as offering superior performance at minimum cost.

Ask your Wyandotte representative to help you select one of the following products for your barrel-finishing jobs:

Wyandotte Burnek 22—for burnishing ferrous and non-ferrous metals.

Wyandotte Light Alloy No. 1—for deburring some ferrous and non-ferrous metals.

Wyandotte Burnishing Compounds 317 and 321—for deburring and burnishing some ferrous and non-ferrous metals.

Wyandotte Burnishing Powder—for deburring and burnishing ferrous metals.



THE WYANDOTTE LINE—products for burnishing and burring, vat, electro, steam gun, washing machine and emulsion cleaning, paint stripping, acid pickling, related surface treatments and spray-booth compounds. An all-purpose floor absorbent: Zorball. In fact, specialized products for every cleaning need.



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Wyandotte Chemicals Corporation
BOX 9, WYANDOTTE, MICHIGAN

Please send free copy of technical report giving information on barrel finishing.

Name _____
Street _____
City _____ State _____

Construction

warehouse or an office building?

A. Anyone may proceed by self-authorization to build a store, a warehouse or an office building, provided he uses no more than two tons of steel, no more than 200 pounds of copper, and no alloy steel, stainless steel or aluminum, except Class B products made from aluminum such as screens, doors, etc.

Q. Can anyone build a structure for recreational, amusement or entertainment purposes?

A. The building of recreational, amusement or entertainment structures is limited virtually to the builder who can obtain no more than specified quantities of controlled materials on the open market. No builder will be granted an allotment for such structures if he is not building for the defense effort or cannot prove a hardship.

Q. Are there any exceptions to the rule for self-authorization?

A. There is a special rule governing the building of apartment houses and buildings for recreation, amusement and entertainment purposes.

Q. Must the owner or builder know all his building needs in advance?

A. The owner or builder need only know the amounts of steel, copper and aluminum he will require. He specifies these amounts in his application for materials.

Q. If estimated needs are insufficient, can further materials be authorized later?

A. If sufficient materials are not obtained for building upon first authorization, the builder may reapply for additional materials later on. There is no guarantee, however, that further allotments will be made.

Q. Do the construction regulations apply to agencies of mu-

Construction

municipal, state and Federal Governments?

A. Yes. There are no exceptions to the new orders governing controlled materials for construction.

Q. Once authorized construction schedules and allotments are obtained, is it possible to purchase materials without use of the allotment and "DO" rating?

A. No. Such purchases are prohibited.

Q. Are there any prohibitions on the purposes for which controlled materials may be used in building?

A. There are several prohibitions. Aluminum may not be used for any but industrial construction except in the case of Class B products. Copper and aluminum may not be used for decorative purposes. In addition, copper may not be fabricated, adapted or fitted on the site of the construction for certain specified construction purposes, such as cornices, downspouts and gutters.

Q. Is there a special form used in making application for construction projects when more than specified amounts of controlled materials are used?

A. Yes. Form CMP-4C is used for most building projects. In the construction of a building, classed as recreational, entertainment, or amusement on certain specified grounds, Form NPAF-24A is used also.

Q. Where can application forms for building projects be obtained?

A. Application forms may be obtained at any Federal or District Office of the Department of Commerce.

Q. Under what circumstances may a builder make application for adjustment or exception to NPA's construction orders and regulations?

A. If a builder feels that the regu-

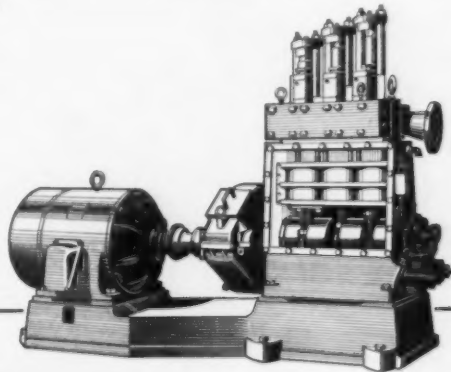


**more
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per pound**

Famous for stamina and a sure foot, the burro was a hard-working "pardner" of the old-time prospector. He's a little fellow—but he packs more horse-power per pound than any of his four-footed cousins . . .

This ability to get more work done with fewer pounds to do it is precisely what Aldrich Direct Flow Pumps have to offer. As a result of improved design, weight of the fluid-end is considerably reduced. And—whereas a speed of 150 rpm was formerly considered high for reciprocating pumps—these compact, Direct Flow units are operating today at speeds of 500 rpm for the 3"; 360 rpm for the 5"; and 300 rpm for the 6" stroke. In each case, you get greater volume and higher pressure from a smaller pump: *you get more horse-power per pound.*

Applications where you'll find Aldrich Direct Flow Pumps putting in time and over-time include: hydraulic systems for press operation; plastic and rubber molding and extrusion; steel mill descaling, and other uses in the petroleum and chemical industries. Write today for Data Sheets 64, 64B.



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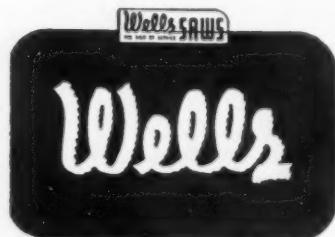
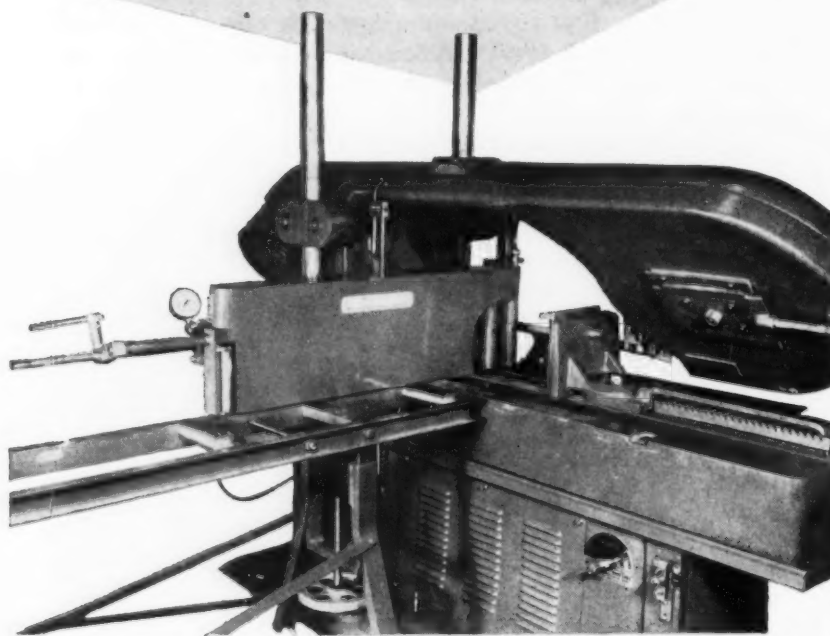
Wells No. 12 Metal Cutting Band Saw and Wells-O-Bar Feed Master

ANY quantity of identical lengths of bar stock are cut automatically in a Wells No. 12 Heavy Duty Metal Cutting Band Saw equipped with a Wells-O-Bar Feed Master.

In operation, the cutting head of the saw descends at a rate governed by a predetermined blade pressure setting. At the completion of each cut, the head automatically rises to a preset height and the stock is automatically projected for the next cut. The machine requires no attention except for reloading. The saw is powered by two electric motors ($3/4$ and $1\frac{1}{3}$ H.P.); the feed requires air at 60 to 80 psi. Capacity of the saw is $12\frac{3}{4}$ " O.D. for rounds, 12" x 16" rectangular; standard feed will project up to 17".

The feed mechanism does not interfere with the use of the saw for making single cuts. Saw and feed can be purchased separately or as a combination. The feed unit can easily be attached to horizontal band saws now in service.

Ask your Wells Dealer for complete information or write direct.



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BAND SAWS**

WELLS MANUFACTURING CORPORATION
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Construction

lations work an undue hardship upon him, not suffered by others in the same industry, or if he feels that the enforcement against him is not in the interest of the defense program, he may file an application for adjustment or exception.

Q. If building has not been started before the new regulations are in effect and the builder has the necessary materials on hand, must authorization to start construction be obtained?

A. No. But he may not use the materials to build apartment houses, or recreation, amusement and entertainment facilities.

Q. Does the builder of a large number of one-family homes in a development project obtain his materials on the basis of each individual dwelling unit, or on the basis of the project as a whole?

A. He obtains materials on the basis of each individual dwelling unit. If the materials needed for each home do not exceed the specified amounts, he may self-authorize his material orders.

For details: "Q & A on Construction under CMP."

Boston Naval Shipyard Projects

With the announcement of a number of major projects assigned to the Boston Naval Shipyard, thousands of workers are expected to flock to that city. Work is on the books for at least 2 years.

Among Boston projects will be the armament reconversion of the USS Columbus, one of the Navy's heaviest cruisers, according to Rear Admiral Hewlett Thebaud, First Naval District commander.

The Boston yard will also convert four destroyers to radar picket destroyers. The projects at the yard are part of a huge conversion program in which the

Construction

avy will modernize 98 vessels, including three aircraft carriers, and will build four new naval vessels.

The Portsmouth, N. H., and Groton, Conn., shipyards have a number of vessel reconversions that will also keep them busy for some time.

Pacific Cast to Build in Utah

The Pacific States Cast Iron Pipe Co., located near Provo, Utah, expects to build a new office building within the next few months to replace the frame structure which has served as headquarters for more than 20 years.

With operations at full capacity, turning out about 8000 tons of 4-in. to 24-in. diameter centrifugally cast iron pipe per month, more elbow room is needed.

Pig supplies have been adequate according to Harvey King, plant manager, even under the limitations imposed by relining operations at Geneva Steel.

Sun Oil Plans Canadian Refinery

Its first Canadian refinery will be built at Sarnia by Sun Oil Co. at a cost of about \$10 million. It is part of the company's \$40 million refinery modernization program. The Sarnia plant will be started in spring of 1952 and be completed in 1953.

The Canadian refinery will contribute from 10,000 to 15,000 bbl daily to Sun Oil's planned capacity increase of 40,000 bbl daily. Other expansion programs are under way at Marcus Hook, Pa., and Toledo, Ohio. This year Sun Oil intends spending \$72 million in the hunt for and proving of new oil fields in Canada and the United States.

Construction Groups Help OPS

Subgroups of the Construction Industry Advisory Committee are aiding the Office of Price Stabilization in working out problems of overtime and reporting forms con-

THOMAS Flexible ALL METAL COUPLINGS

FOR POWER TRANSMISSION • REQUIRE NO MAINTENANCE

Patented Flexible Disc Rings of special steel transmit the power and provide for parallel and angular misalignment as well as free end float.

Thomas Couplings have a wide range of speeds, horsepower and shaft sizes: ½ to 40,000 HP—1 to 30,000 RPM.

Specialists on Couplings for more than 30 years



PATENTED FLEXIBLE DISC RINGS

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FRICTION
WEAR and
CROSS-PULL**
are eliminated
LUBRICATION IS
NOT REQUIRED!

THE THOMAS PRINCIPLE GUARANTEES
PERFECT BALANCE UNDER ALL
CONDITIONS OF MISALIGNMENT.

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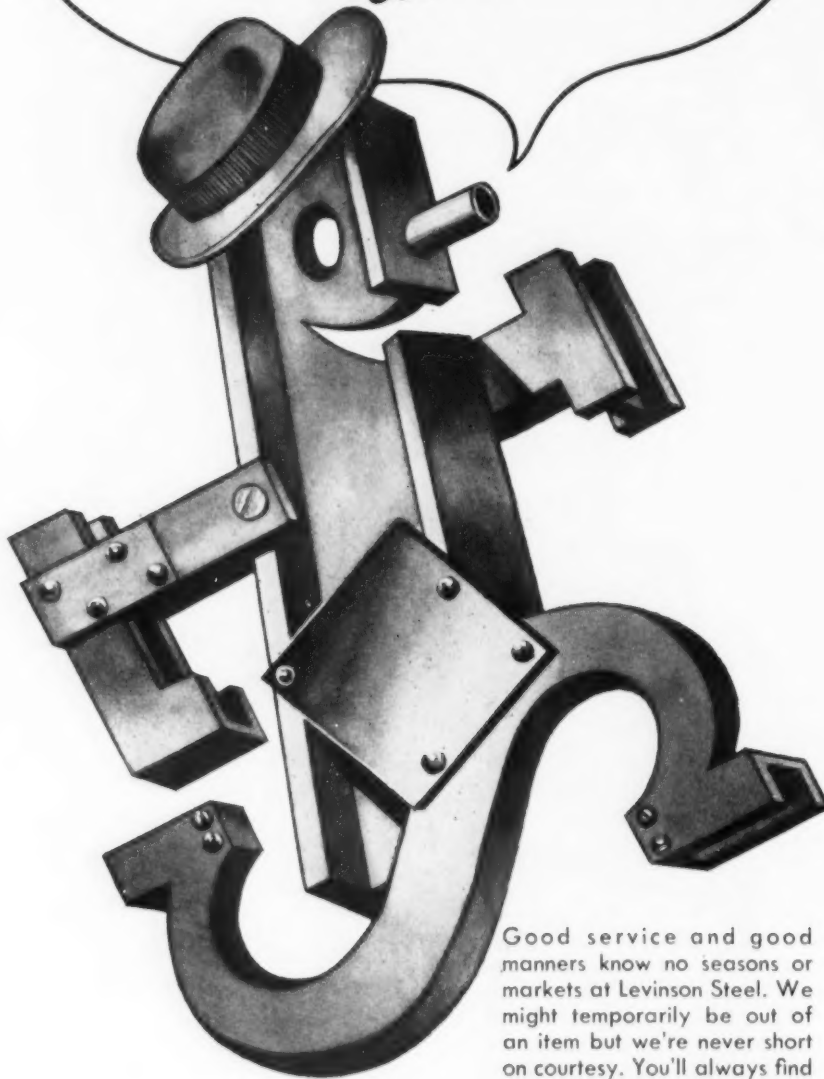
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commodity here*



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Construction

nected with the drafting of single construction price order.

As proposed in recent meetings in Washington, the order would cover any transaction in which the seller furnished labor, materials and services for building, highway, heavy, railroad, or miscellaneous construction. Included would be installation and incorporation of materials or equipment into a structure or construction project, no matter whether the work is new or constitutes an addition.

A final form for the order may also include repair, remodeling, or alteration of an existing building.

TCI Offices Under One Roof

For the first time, all offices of Tennessee Coal, Iron & Railroad Co. will be under one roof before the end of September. They will begin moving Sept. 10 into a just-completed \$6,500,000 office building at Fairfield, Ala. The 26 departments have been scattered over Birmingham, Ensley, Pratt City and Fairfield.

General offices of Birmingham Southern Railroad Co., a T.C.I. subsidiary serving Birmingham industrial plants and connecting the large T.C.I. plants with the trunk-line railroads entering Birmingham, also will be located in the building.

The new structure has office space for 1500 employees. It is leased to T.C.I., to whose specifications it was built, by the owner, the Flintridge Corp. Architects were Holabird, Root and Burgee of Chicago, and Jack Smith, of Birmingham, associate architect. Daniel Construction Co., of Birmingham, Alabama, was general contractor.

New Plant to Make Gears

Sterling Electric Motors, Inc., Los Angeles, has let contracts for a new \$1 million plant on an 18-acre site in Van Wert, Ohio. The new plant is designed to expand Sterling's gear manufacturing facilities for defense production of precision gearing systems for the aircraft industry.

Sales Promotion

Model Toys:

Road building equipment makers hit promotion paydirt with model toys.

A group of road building equipment manufacturers have been moving into sales promotion paydirt through toys that duplicate their major features.

Scaled to about one-sixteenth the size of the actual equipment, the toys serve to attract attention outside the usual sales promotion channels and are used in public relations as gifts to prospects and direct sales work.

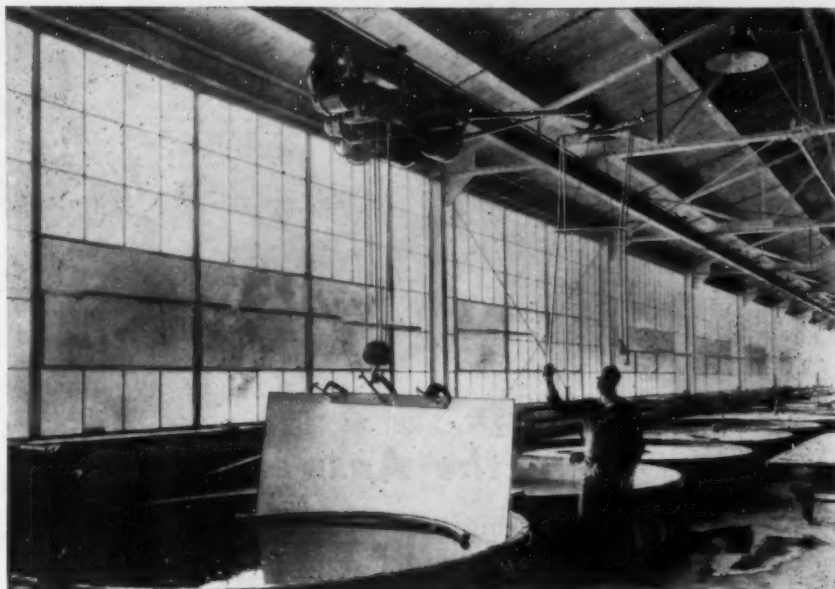
The toys are the brainchildren of two Cincinnati brothers, Charles and Fred Doepke who, in 5 years, have established a national reputation for their Model Toys. Sturdily built, premium priced (from \$12.95 up), the toys are based on the blueprints which the original equipment companies loan to the brothers.

Who Uses Them—Among the current select group are J. D. Adams Mfg. Co., Indianapolis; Euclid Road Machinery, Cleveland; Unit Crane and Shovel and the Heil Co., both of Milwaukee.

American-LaFrance of Elmira contributed the only deviation from road equipment in a model of their big aerial ladder fire truck. And the Barber-Greene Company of Aurora is still using a counterpart of their bucket loader even though the brothers have discontinued its production this year.

Besides these companies, the brothers also prepare special custom-built models for other manufacturers to use in their sales work. These models are expensive, ranging from twenty dollars per copy up. But the companies find them useful to their salesmen when the big, heavy equipment cannot be easily moved to a prospect's office.

Special features are miniaturized in the Doepke's engineering department and the basic idea is to make sure they work and look like the original counterparts. That holds true for their mass production toys, too.



How to keep a hoist from growing old before its time!

The time to add years to the life of your hoist is *before you buy it!*

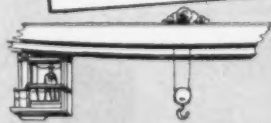
You can do this and avoid costly production slow-downs later if, before you buy, you estimate what the maximum and average loads are to be; how frequently your hoist will be called upon to handle those loads within a given period.

You will also want the answers to these questions: What distance is the load to be lifted and lowered, and at what speeds? How quickly must the hoist travel from one location to another to keep production at top efficiency? What temperatures are likely to prevail? Are there any corrosive influences? . . . and many others.

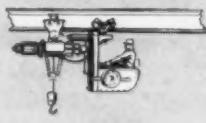
You can save your time now, and considerable trouble later, by asking a Shepard Niles specialist to study your problem and recommend the most economical hoist for you—in terms of your own specific operations. We invite your inquiries.

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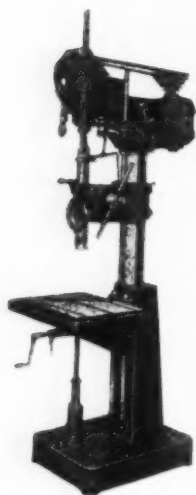
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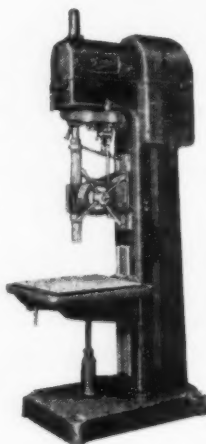
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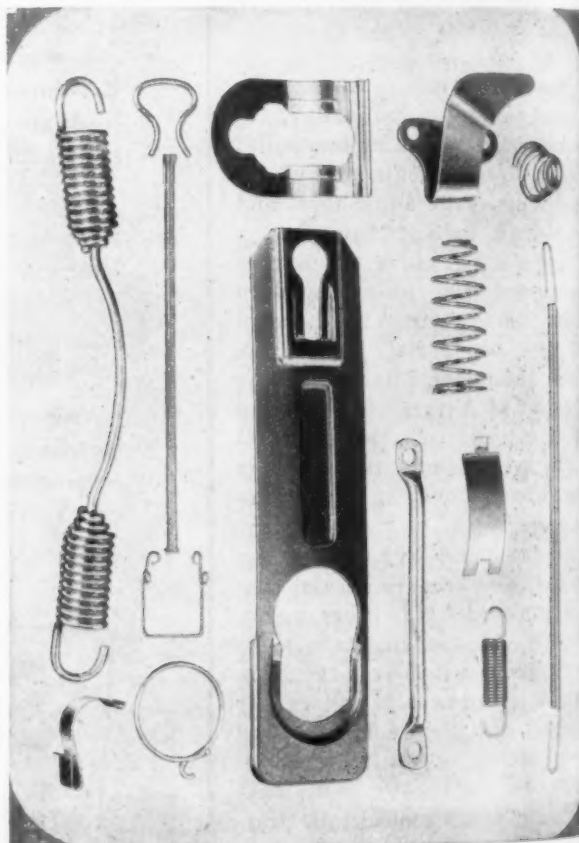


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This Week in Washington

Tax Writeoff Freeze Permanent?

Mobilizer Wilson may delay ending moratorium on fast tax writeoffs . . . Firms can't get materials, anyway . . . Official says program not dead, merely slumbering—By George Baker.

It's not official yet, but Defense Mobilizer Charles E. Wilson has decided against any early resumption of issuing fast tax writeoff certificates.

Wilson's decision on Aug. 13 to hold up the granting of all amortization benefits for 60 days was based on what he called the need for review of the criteria on which certificates are granted.

No Materials, Anyway—Now beginning to look as though the chances for resumption in the near future of the tax-benefit program are extremely slim. Principal reason: Defense Production Administration's decision to cut to the bone all allotments of controlled materials for plant expansion purposes.

As one government official puts it: "What's the point in issuing authorization tickets to manufacturers who can't get the materials to build the plants?"

Fourth quarter allotments of carbon steel for plant expansion during the fourth quarter have been officially set at 217,000 tons. DPA officials are predicting officially that this same cutback (about 45 pct) probably will be extended through the first and second quarters of 1952.

Not Dead—Sleeping—This does mean that the government is checking all plans for expansion in defense production. It does mean that expansion will proceed at a retarded rate—perhaps for another year.

Manly Fleischmann, DPA-NPA chief, puts it this way:

"I want to make it abundantly clear that the projects not ap-

proved are not being permanently denied.

"What we are doing is telling the applicants their projects must be deferred to a later date."

Isn't That a Lot?—Senate taxwriters have decided unofficially that somewhere between \$6,000,000,000 and \$6,500,000,000 in new revenue is the most President Truman can expect this year.

Block the Source—Only way to stop spending, as George sees it, is simply not to raise revenue every time the Pentagon talks the President into raising the budget by X-million dollars.

Even a \$6,000,000,000 increase in taxes would mean that federal levies would be increased by \$17,-



MOBILIZER WILSON . . . No more fast tax writeoffs?

000,000,000 since the start of the Korean war. Two tax bills passed last year totaled about \$11,000,000,000.

Help the Small—As far as excess-profits taxes are concerned, the committee is trying to come up with a new formula that will encourage smaller firms and also ease this particular tax burden on new corporations.

Senator Hendrickson R., N. J., calls for a ceiling of 52 pct on all taxes, including excess profits tax on small new-growth companies for the first 5 years of their existence.

Drafting Junior — "It's like drafting children under 12 years of age for military service," he says of present excess profits rates as they apply to new firms.

Feeling among many committee members is that new firms will be able to pay far greater tax returns in a few years if they are permitted to grow normally.

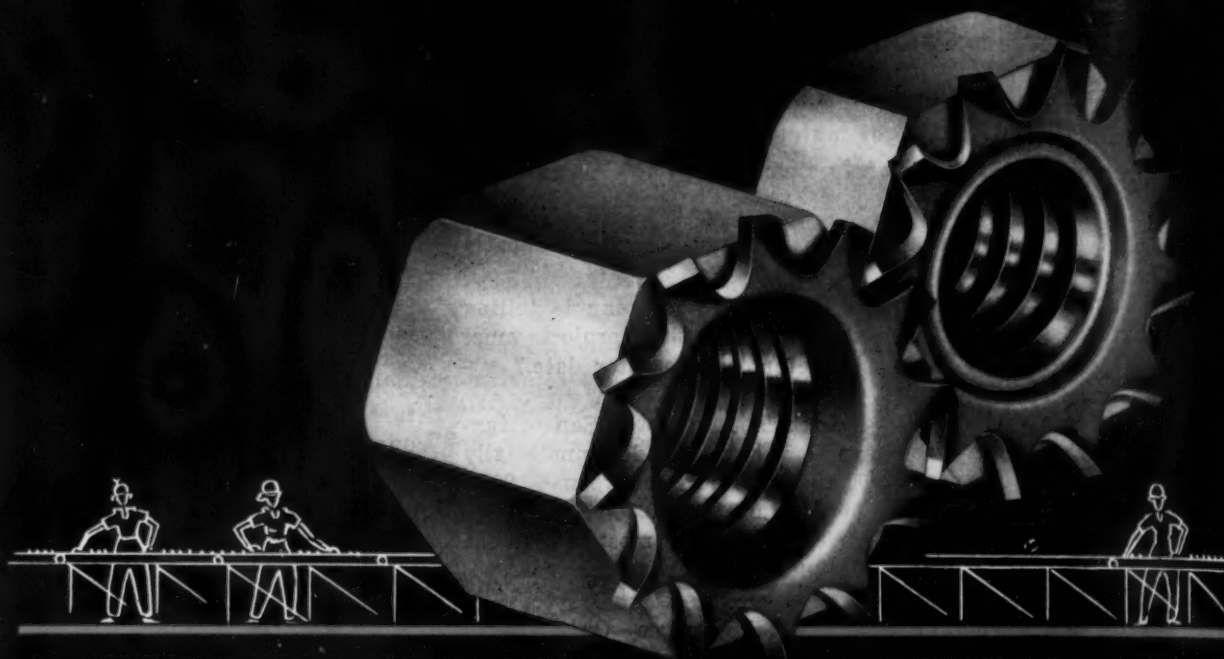
Antitrust to Baseball—On Capitol Hill, a full-blown, table-pounding antitrust investigation is supposed to be as perennially popular with voters.

In the House, Congressman Celler, D., N. Y., heard the "call" for a grass-roots investigation of monopoly more than 2 years ago. He has yet to issue a final report and is now investigating baseball.

It's a Fad—Senate Small Business Committee has now yielded to the "draft." It plans a long-range investigation of how the antitrust laws are being administered. "There are indications that there has not been sufficient vigilance in this field during the past 10 years," Chairman Sparkman, D., Ala., says.

Committee expects to take 4 to 6 months laying the groundwork for its study of what's been done—and what hasn't been done—for small business in recent years.

Where 1+1=1.....



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Pre-assembling lock washer and nut was a tricky operation. The washer had to be

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†Trademark, Shakeproof, Inc., Division of Illinois Tool Works.

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For information on Titanium Developments contact Mallory-Sharon Titanium Corp., Indianapolis 6

SHARONSTEEL

CUTBACKS: Production Traps Deepen

Consumer durable goods producers get cuts in all basic metals . . . Copper may prove bigger obstacle to output than steel . . . England promised up to 3 million tons of steel.

Part men on the Controlled Materials Plan totem pole—manufacturers of consumer durable goods—in the fourth quarter be given Defense Production Administration permission to try and hunt 58 pct of the steel they used during pre-Korea 1950. It was 70 in the third quarter 1951. They must get this steel in the various shapes and sizes they need and will be meeting stiffer shortages in different products which may nullify some of their output potential.

Nonferrous Pitfalls—Theoretically, the steel allotment should be cut to production 58 pct of what was in 1950. But availability of copper and aluminum may drop production below the quotas possible with steel. Copper consumption has been sliced to 54 pct of 1950, aluminum to 46 pct. It was 60 pct and 50 pct before.

add an originally wicked copper shortage to production irretrievably lost in the strike, and the total is production trouble. Detroit automakers are expecting to feel the copper axe in October. Smaller manufacturers have already felt its bite.

Consumer durable makers who draw steel from warehouses will find the shelves a little barer, product variety reduced. (THE NEW YORK TIMES, Aug. 30, 1951, p. 91.)

Steel to England—Unofficial word from the United States to supply England with from 2 million to 3 million tons in 1952 will further reduce supply of steel to U. S. This bleeding by England will not hit high priority defense projects but will be taken out of allocations to consumer industries. DPA officials are banking on the warehouse and retail re-

serves of finished consumer hard goods such as refrigerators, radios, washing machines, autos to balm the sting of production cutbacks. They feel that with these stocks, resulting from a slide in consumer demand, fourth quarter allocations and what's still in stock should prove "adequate to meet normal demand and provide adequate employment."

Long-Term Shortages—DPA has realistically accepted the fact that shortages in the basic metals will continue through 1953.

Tonnagewise, steel allocations in the fourth quarter were: 984,-

793 tons, which include 24,400 of alloy and 10,085 of stainless.

Copper allocations totaled 53,900,000 lb, including 8,900,000 lb of wire mill and 2,450,000 lb of foundry products. The aluminum allocations amounted to 59,000,000 lb. Others were:

Light bulbs, half to be set aside for industry, 90 pct; safes and vaults, 65 pct; shelving and lockers, 70 pct; professional furniture, 70 pct; hospital utensils, 75 pct; license plates, 100 pct; portable lighting devices, 90 pct; dry cells, 90 pct; food products machinery, 76 pct; commercial cooking equipment—electric, 87 pct, other, 75 pct; commercial dishwashers, 99 pct; and marking devices, 60 pct.

Machine Tools:

Shortage major defense bottleneck; Production must be doubled by 1952.

Still greater quantities of raw materials must be allotted to defense production. And more machine tools must be made to process them.

So says Defense Mobilizer Charles Wilson.

The mobilization director says that lack of special-purpose machine tools is a major bottleneck to production. He estimates that \$3 billion worth of machine tools of all kinds must be turned out in 2 years.

Allocations Available—Defense agencies are thinking of turning to companies outside the industry for special tool production. CMP officials stand ready to allocate steel and other controlled materials from the military reserve set-aside if needs be.

Mr. Wilson's estimate of the materials situation is not good news to manufacturers of civilian type goods who have just been cutback more than 40 pct in controlled materials.

The pinch on civilian production is here, he says, and with conversion to defense production virtually completed there will be a sharp step-up in defense requirements shortly.



COPPER: A dynamite charge blasts loose copper ore in Chile's "Valley of the Moon" basin. This major deposit is an important supplier to the U. S.

Industrial Briefs

Manila Mill—Loewy Rolling Mill Div., HYDROPRESS, INC., has received an award for a steel mill from the National Shipyards & Steel Corp., Engineer Island, Manila, Philippines, and agency of the Philippine Government. The award covers the supply of a complete merchant and structural mill installation including all mechanical and electrical equipment and furnaces, valued at approximately \$2 million.

APSPAA Publication — Problems of air purification will be discussed in a new magazine, "Air Repair," published by the Air Pollution & Smoke Prevention Assn. of America, with headquarters in Mellon Institute, Pittsburgh. The magazine is a successor to "Smoke," which evaporated a few years ago when scope of APSPAA was broadened to include all phases of air contamination.

Carpenter Gets Works—Purchase of Webb Wire Works has been announced by CARPENTER STEEL CO., Reading, Pa. The plant will continue to manufacture the same products for the same markets from the same location, and will be known as the Webb Wire Div. of the Carpenter Steel Co.

Merger Planned—An agreement and plan of reorganization awaits approval in the merger of THOMPSON PRODUCTS, INC., Cleveland, and MUSKEGON PISTON RING CO., Muskegon, Mich.

Company Improvements — NILES ROLLING MILL CO., a Sharon Steel Corp. subsidiary, has started construction of a one bay extension of its galvanizing building, a new two story stores, laboratory and engineering building and a new machine shop. Cost of these improvements is estimated at \$335,365.

Announcement—J. E. Eckel has disposed of his interest in JERSEY SHORE STEEL CO., INC., Jersey Shore, Pa., which interest has been purchased by John A. Schultz and Charles M. Schultz of Williamsport, Pa., who will continue to operate the company at its present location.

Commercial Isotope Production—Atomic Energy Commission has accepted two proposals for private firms to study, at their own expense, the commercial feasibility of manufacturing, processing and selling radioisotopes. Contracts have been signed with BENDIX AVIATION CORP., Detroit, and TRACERLAB, INC., Boston.

Bowser Buys—BOWSER, INC., has acquired ownership of National Scientific Laboratories, Inc., Washington, D. C. The merger joins the present research and production facilities of Bowser with the extensive organization and facilities of National.



Munson Honored—The new self-unloading Great Lakes limestone-carrier, under construction for BRADLEY TRANSPORTATION CO., Manitowoc, Wis., will be named the Steamer John G. Munson, in honor of the retired U. S. Steel vice-president.

Armco Acquisitions—ARMCO STEEL CORP. has purchased all the outstanding stock of the Ohio Marble Co. and Piqua Stone Products, Inc., both of Piqua, Ohio.

Rehabilitation—AMERICAN STEEL FOUNDRIES, INC., Chicago, is re-

habilitating the armor plate plant which it operated during the last war adjacent to its East Chicago plant. The plant, containing 1,400,000 sq ft, will be devoted to Ordnance Department needs in cast armor, turnings and hulls.

Corporation Formed—A new manufacturing firm for production of portable steel bleachers has been formed. The company, SEATING INC., located at 3565 Wooddale Ave., St. Louis Park, Minn., will manufacture "Sico"-brand bleacher equipment.

Under Contract — Pittsburgh Sheet Co. awarded RAGNAR BENSON INC., Pittsburgh, the general contract for the erection of the new 66-in. sheet and strip mill, at its Allentown, Pa., plant.

New Identification — Operadio Metal Co., St. Charles, Ill., has changed its name to DUKANE CORP. The change of corporate name identifies the enterprise more closely with the trademark under which many of its products have been sold for some time.

Metal Trades Award—Hugh L. Bill, vice-president in charge of industrial relations of ACME STEEL CO. will receive the annual Industrial Relations Achievement Award of the National Metal Trades Assn., at the 52nd annual convention to be held in Chicago. The award in the form of an inscribed plaque, recognizes the American citizen whose contribution in the field of industrial relations is deemed most important.

Title Altered—The corporate name of Southern Alkali Corp. has been changed to COLUMBIA-SOUTHERN CHEMICAL CORP. and is a wholly owned subsidiary of Pittsburgh Plate Glass Co., Pittsburgh.

Addition Completed—PIVOT PUMP & DIE CORP., North Tonawanda, N. Y., has recently completed addition to their factory which adds 20 pct.

In Agreement—DOMINION STEEL & COAL CORP. has awarded Koppers Co., Inc., a contract for 61 new chemical-recovery coke ovens for Sydney, Nova Scotia, plant.

*Patterns in
Pensions*

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SHOULD BE GEARED TO YOUR COMPANY EARNINGS

IF your company EARNINGS ARE STEADY

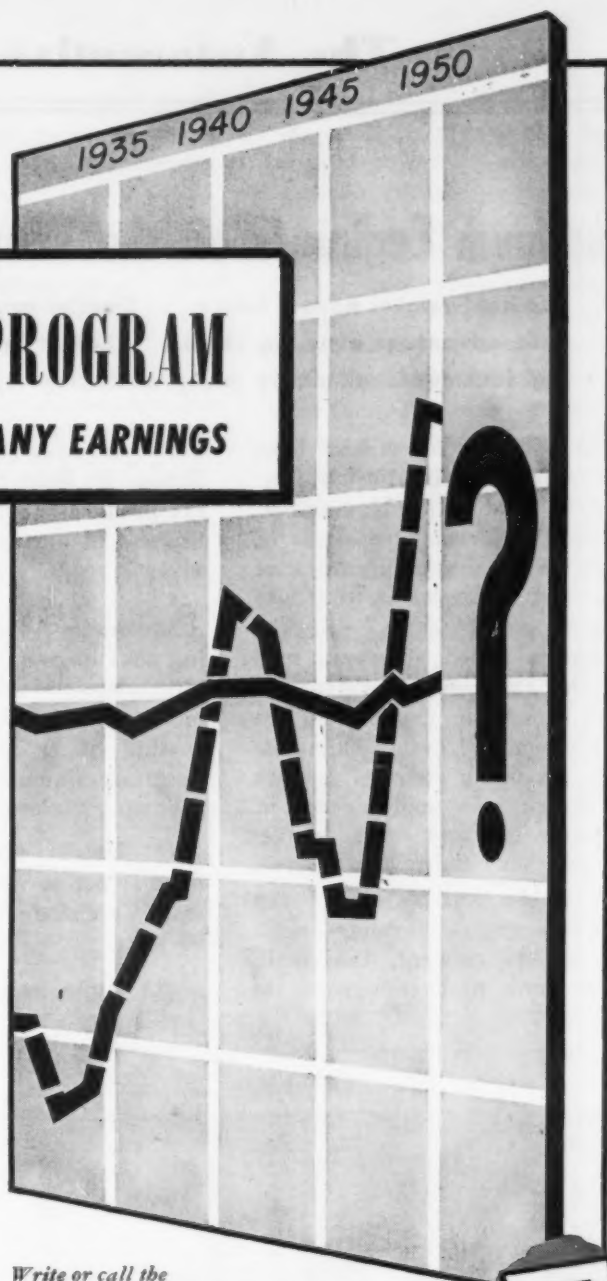
Your company probably can afford the permanent commitment of an adequate pension system.

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The Automotive Assembly Line

Aluminum Engine Is on the Way

The lightweights have a future . . . Smaller producers seem to have advantage over Big Three . . . Latest brazing, die casting techniques eliminate many obstacles—By Walter Patton.

That Kaiser-Frazer has been developing new lightweight engines to take full advantage of the many desirable properties of aluminum has greater significance than most followers of the auto industry suspect.

Some informed observers predict the successful development of an aluminum engine will initiate a chain of events culminating in sweeping changes in both the design and manufacture of passenger car and truck engines. At least that's the talk in Detroit.

An interesting aspect of the aluminum engine development is that, at the moment, the small, independent producers seem to

have some advantages over the Big Three. At least two independent car producers have had an active interest in aluminum engines for several years.

Aluminum Advantages—By taking advantage of the properties of light metals—including the latest techniques for brazing and die casting—it is now possible to build aluminum engines with the following claimed advantages:

(1) Weight saving will be at least 50 pct as compared with cast iron. This saving may even exceed 60 pct.

(2) Using proper design, it is

now possible to build powerful V-6 and V-8 engines in which practically all foundry coring is eliminated. Cost of machining the casting is also greatly reduced. The combined savings due to greatly reduced weight and other factors may eventually make possible an aluminum engine costing about the same as cast iron.

(3) Properly designed aluminum engines will operate on standard fuel at higher compression ratios than cast iron. Ratios of 9 to 1 are possible with standard fuel in an aluminum engine.

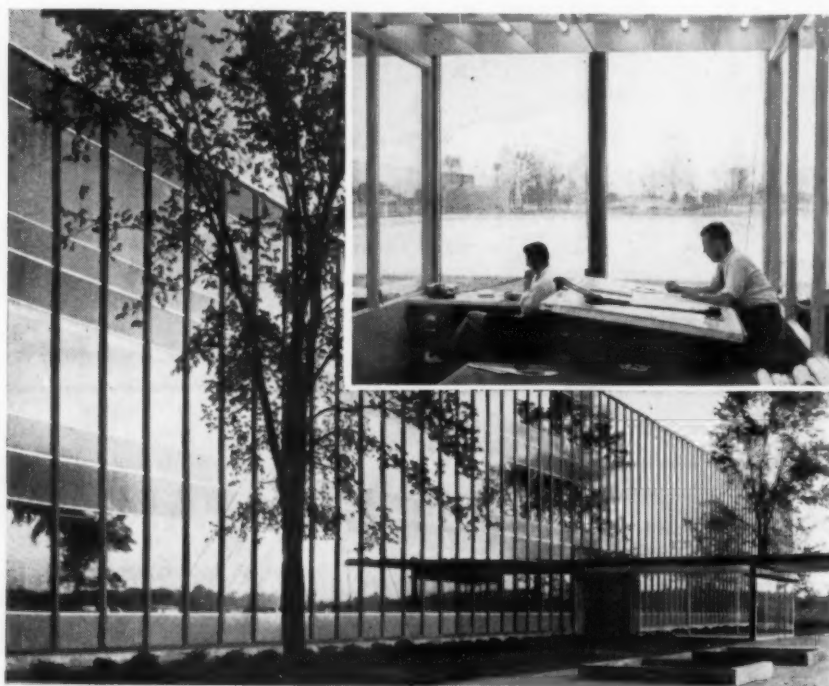
(4) Steel liners can be used. Chromium-plated aluminum liners have been used in small engines.

Alcoa Research—The use of permanent mold foundry techniques has been made possible by recent development work carried out by the Aluminum Co. of America at its Cleveland experimental foundry. It is now possible to cast aluminum auto engine blocks in permanent molds as two or more relatively simple castings.

Idea's Not New—Another possibility with aluminum is to die cast both the block and head. Much experimental work remains to be done in this field but the possibilities are extremely promising, according to several investigators.

Aluminum engines are not new. Many aluminum prototype engines have been built by the automobile industry. However, until recently no engine designer was in a position to consider brazing or die casting for volume production of engines. It is these two recent metalworking developments that has injected into the picture some new possibilities for aluminum engines that have not previously existed.

There is another possibility with aluminum engines that few



TECH CENTER: A show of glass windows and styling makes General Motors' Technical Center a masterpiece of modernity. Upper right hand interior view shows a designer's office in the Engineering Building. Note the view. (See p. 134.)

people have stopped to consider. Suppose, for example, that an independent producer brought out a car equipped with an aluminum engine and that the styling is entirely new and distinctive. Wouldn't such a car—if it caught the public fancy—attract 100,000 to 200,000 buyers a year?

The first aluminum engine to reach production may be a 4-cylinder model with opposed cylinders.

Tech Center:

GM opened it last week . . . Engineers moved in first . . . stress modernity.

The new General Motors Technical Center was formally opened last week—5 years after the first announcement. Originally occupying 320 acres on Mound Rd. near 12-Mile Rd., the project has been expanded to 813 acres.

Modern Features—The entirely modern buildings were designed by Saarinen-Saarinen & Associates, Bloomfield Hills, Mich.

Architects-engineers are Smith, Hinchman & Grylls, Inc. Bryant & Detwiler Co., Detroit, is the general contractor.

The new buildings are designed to permit full use of the building without obstructing columns. Special truss and exterior wall columns are employed. North and South exterior walls consist almost entirely of double-plate heat and glare absorbing glass, hermetically sealed. Other outstanding features of the new building include: (1) flexible interior arrangements, (2) movable partitions for offices and drafting rooms, (3) special fluorescent lighting, (4) custom-designed furniture.

Confidential Jobs—At the new GM Technical Center a group has been set up to handle experimental wood and sheet metal work. Originally formed in 1945, the facilities are greatly improved and expanded. This group fabricates highly confidential GM projects

that cannot be handled by outside shops. It has facilities to construct complete bodies, patterns, sheet metal and die models.

There is also a semi-production department of this group which makes low production runs of complicated sheet metal parts and service parts where production dies have been destroyed.

Although it was originally designed for peacetime research and investigation, GM has disclosed that its new Technical Center is already crowded with national defense work.

Power Steering Progress

The forward march of power steering continues. Chrysler Div. has announced the production of the 13,500th Hydraguide, the revolutionary power steering device introduced on 1951 Chrysler models.

Many Detroit observers believe General Motors will have power steering on both Cadillac and Buick 1952 models.

Copper Strike Repercussions

Indications are growing that repercussions from the copper strike will hit Detroit production probably during October. Many auto manufacturers see gaps in copper deliveries interfering with October assemblies.

Thus far, the industry has found few important applications where a substitution can be made for copper.

Steel Shortage to Ease?

The possibility that the steel shortage may ease somewhat during the final quarter of the year, although not shared by all steel buyers, is seen in some quarters here. At least one firm which found itself in an extremely tight steel position now sees comparatively clear sailing ahead unless unforeseen complications develop.

Steel is not easy—far from it. It's just that the impossible now seems possible in Detroit.

THE BULL OF THE WOODS

By J. R. Williams





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Manpower Is Big Shortage Coming Up

Labor scarcity becoming problem . . . Exporters fear Japan may buy Chinese iron ore . . . NPA scrap drive results poor . . . Smoke control progress . . . Power pinch—By R. T. Reinhardt.

Shortages of materials may soon become of secondary importance to western manufacturers. Scarcity of labor is likely to take its place on the gripe parade.

Highest employment in history was reported in July for California; 879,000 were employed in manufacturing alone—within 10,000 of the V-J Day peak. Employers wanting skilled men must almost resort to shanghai tactics.

Utah reports its labor supply just about in balance with demand and that further industrial expansions will necessitate importation of workers or tapping of the female reserve.

Easier in Winter—Tapering off of construction activity in Alaska as winter approaches may ease the problem in the Pacific Northwest. Hundreds of skilled men have been knocking out large pay checks on government projects by working 10 hours a day 6 days a week, and 8 hours on Sundays. They'll pull out when the snow flies.

Manufacturers might well give time and thought to reducing labor turnover—a project involving more than payment of “going wages.” A stabilized labor force may even pay cash dividends as well as assure production as in California where an experience rating system governs amount of payroll unemployment taxes.

Peace Treaty Sidelight—Exporters of iron ore to Japan are wondering about the effect of ratification of the Japanese peace treaty on future contracts.

As a sovereign nation Japan theoretically can buy ore from

Communist China—probably considerably cheaper than she's getting it from us. Unofficially, Japanese observers in San Francisco for the treaty conference indicated that country will follow the example of the United States in banning trade with the present Chinese government. Whether those good resolutions will weather the temptations arising in adversity is the question.

Shipments of iron ore to Japan during this third quarter will be 330,000 tons from U. S. and Canada; 400,000 tons from the Philippines; 110,000 tons from Malaya; 60,000 tons from Hong Kong; 50,000 tons from Goa; 40,000 tons from South Africa; and 30,000 tons from India.

NPA Drive Hits Snags—Western NPA scrap drive committees report some encouraging results, but observers fail to see any material effects. Greater efforts must be exerted—probably on a broader front—to increase flow to mills to the 20 pct over last year goal.

Shortages of labor and freight cars have hampered collections.

More than 7500 tons of Korean railroad scrap, described as “beau-

tiful heavy melting,” came into Los Angeles last week for Bethlehem Pacific. More is expected.

Reverse Twist—Shipment of 500 tons of scrap brass and copper to Holland and Germany by Schnitzer Steel Products Co. of Portland, Ore., caused a mild furore on the waterfront. Longshoremen, recalling steel scrap shipments to Japan just before Pearl Harbor, and aware of the domestic copper shortage, were somewhat perturbed.

Leonard Schnitzer reported that this was a part of 3500 tons of similar scrap received recently from Saipan and that it had been cleared for export by our government. Remainder is to be sent to domestic smelters.

Kaiser Smoke Control—A 95 pct reduction in outpouring of smoke from one of Kaiser Steel Corp.'s eight openhearth stacks at Fontana, Calif., is expected by early installation of an electrostatic precipitator.

Operation of this unit will guide the company on future installations and is the first element in a \$1.3 million study of smoke control. Although located in San Bernardino County and not subject to the rigid smog controls of neighboring Los Angeles County, the company believes this is good public relations.

Boosting Output—Bethlehem Pacific Coast Steel Corp., which has been having its troubles with the L. A. County smog control board, will close down its three openhearths in Los Angeles in December.

By that time its new electric furnace rated at 75-ton capacity will be in operation. Capacity is expected to be increased to 90-ton by stepping up the electrical system. One of the three openhearths will have to be taken out to make room for the new furnace.





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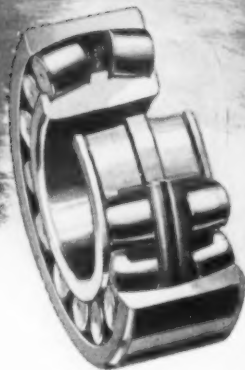
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SPRINGS • WIRE FORMS • STAMPINGS

Toolmakers Will Get More Relief

NPA expected soon to announce priority for getting parts . . . Munitions Board tool priority among defense projects . . . Navy opens its shops to tool subcontracting—By George Elwers.

Two priority systems involving machine tools are reported near completion in Washington. National Production Authority is expected soon to announce a limited super-priority plan for obtaining needed components. And the Munitions Board is said to be readying a plan indicating relative priority among defense projects for obtaining new machine tools.

NPA is not granting the machine tool industry the blanket super-priority for all purchases that the industry has long been asking for. Instead, the plan will provide for special-purpose priorities for specific items.

What Priority—Machine tool builders, for example, may get the right to first call on such components as bearings, motors, and controls. Their priority would give them preference over other defense orders, even though carrying the standard DO priority, for the same equipment.

The manufacturer on whom the priority is served would be able to extend it for obtaining such components as he needs to fill the order. The plan is not intended, however, to extend to purchase of basic materials.

Jam Breaker—The plan is intended to help solve the present jam of equipment on assembly floors, complete and ready to ship except for one or two components which cannot be obtained. NPA, with the help of the National Machine Tool Builders' Assn., is quietly gathering data on the number of machines thus being held up. These statistics indicate

the need for the special-purpose priority.

Diversion—At a meeting a year ago, the machine tool industry endorsed establishment of a plan for machine tool distribution like the E-1-b order of World War II. Munitions Board representatives were present at this meeting. But no action ensued. Now, the growing number of cases in which it is necessary to order diversion of machine tools from one customer to another whose immediate need is greater, has apparently convinced the Munitions Board that action is needed.

Navy Moves—An important step toward increased machine tool production has been taken by the Navy. It has ordered Commandants of all Navy Yards and similar facilities to accept machine tool subcontracting work wherever machine time is open.

One of the biggest problems in subcontracting machine tool production is the fact that so few of the potential subcontractors

have the right type of equipment available. Appliance makers and auto body plants just don't have the big tools needed for such work as planning machine tool beds.

But the Navy has plenty of machine tools, of all sizes. Just how much time on the big machines is available for outside work is not known. But even a little time will be a big help.

GM Bullards—Apparently Washington intends to push through the deal for General Motors' Fisher Body Div. to build Bullard vertical turret lathes. The project has long been in the discussion stage. But various problems have kept it from completion. Chief among these have been the number of machine tools Fisher would have to buy to get into production, and the high cost at which it would have to sell the machines.

But, following Defense Mobilizer Wilson's statement that \$3 billion in machine tools is needed in the next 2 years, projects like this will probably be pushed regardless of cost.

Ambitious—Wilson's estimate that the industry is now producing at an annual rate of \$800 million seems high to industry leaders. And his goal of twice the present rate next year seems way out of reach now.

Viewing One Side—Labor Secretary Tobin, forgetting about shortages of materials, components, and production facilities, has said the machine tool industry could double its output this year. But, he adds, about 30,000 more workers would be needed—50 pct more than the industry now employs. This would include 5000 skilled machine tool operators, 400 tool and die makers, and 500 mechanical engineers.

Just where these men can be found, Mr. Tobin does not say.



The *Iron Age*

SALUTES

Charles Franklin Kettering

Few men have done so much to sell America's industry to America. . . With wit, cool words, inventions, he has lighted new roads in a period of tremendous industrial expansion.



CHARLES FRANKLIN KETTERING just had a birthday. It was "Boss Ket's" 75th, and auto men gathered in Dayton to honor him with a barbecue-birthday party.

Few men have done so much by word or deed, to sell the automobile and American industry. The former vice-president of General Motors and general manager of the GM Research Laboratories has been the industry's outstanding salesman and spokesman. His inventions are known to every car user.

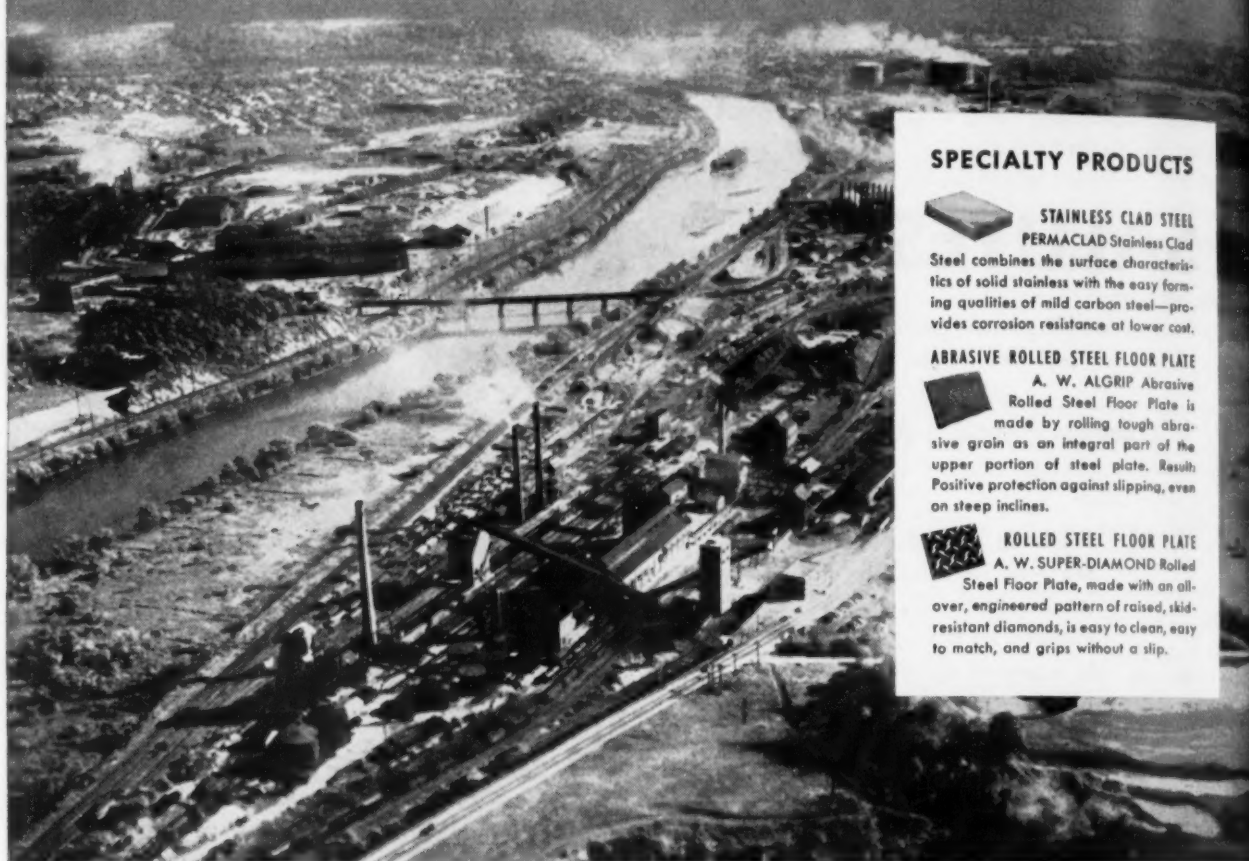
Fresh out of Ohio State University, the young idea-man went to National Cash Register Co. In 5 years he practically revolutionized the cash register business with new inventions and improvements in accounting and calculating equipment.

Experts agree the self-starter did more to popularize the automobile than any other invention. It took the back-breaking toil out of car starting. It was a development of "Boss Ket's" Dayton Engineering Laboratories Co.

When he sold his interest in Delco in 1916 to GM, and joined the GM staff, he opened an era of invention and engineering development. Under his leadership GM engineers produced anti-knock fuels, Freon, quick-drying lacquers, balancers, new metallurgical developments, an improved diesel engine.

His sparkling wit and ability to express his thoughts are unmatched in the auto industry. Colleges across the country have honored him. As an effective exponent of a free, creative economy, no one has ever equalled "Boss Ket."

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The Iron Age

INTRODUCES

John M. Brock, appointed director of research, MIDWEST PIPING & SUPPLY CO., INC. Mr. Brock will make his headquarters at the executive offices in St. Louis.

Jack J. Jarms, joined C. B. HER-RICK CO., Cleveland, as assistant sales manager.

George L. Kirp., appointed general production manager of METAL SERVICE CORP., Chicago.

A. R. Caputo, heads the sales department of the AMERICAN BOX CO., Cleveland.

Gilbert T. Bowman, appointed sales manager of gas products for ROCKWELL MFG. CO., Pittsburgh, Robert B. Kitzmiller has been appointed manager of the San Francisco office.

Kenneth R. Peterson, appointed administrative assistant to the president of the FRUEHAUF TRAILER CO., Detroit.

Frederick L. Murray, promoted to assistant superintendent of foundries for HUNT-SPILLER MFG. CORP., Boston.

John Hayes, appointed assistant advertising manager of RIGIDIZED METALS CORP., Buffalo.

John R. Hundley, named director of personnel at GRANITE CITY STEEL CO., St. Louis. M. D. Conroy, vice-president in charge of industrial relations has retired.

H. S. Bishop, joined the staff of BUILDERS STEEL SUPPLY CO., Dearborn, as assistant to the vice-president.

Roger S. Ahlbrandt, elected treasurer of ALLEGHENY LUDLUM STEEL CORP., Pittsburgh.

John A. Hagan, appointed general superintendent of Homestead District Works of U. S. STEEL CO., succeeding H. G. McIlvried who is retiring after more than 50 years' service with the company.

John B. Madden, appointed hydraulic sales manager for the North Central district of A. O. SMITH CORP., Chicago.

Ellison L. Hazard, appointed manager of manufacturing for the Pacific Metals Div. of CONTINENTAL CAN CO., San Francisco.

Frank J. Wood, joined SEIDEL-HUBER STEEL ROLLING MILLS, INC., Seattle, as consulting engineer.

Rollin P. Smith, named project manager of TITANIUM METALS CORP. OF AMERICA's new plant at Henderson Nev. He was formerly at the company's South Amboy, N. J., plant.

Robert H. Erwood, named assistant director of industrial relations for the BUDD CO., with offices in Detroit. Edward Hanafin has been made manager of labor relations at the Charlevoix plant. Richard Rauser, named personnel manager at the Charlevoix plant and Gustave A. Anderson was appointed manager of personnel and labor relations for the Red Lion plant in Philadelphia.

J. L. Mohun, appointed division manager, industrial insulation sales, for the BALDWIN-HILL CO. Mr. Mohun will be located in Houston.

Turn Page



DR. MARK E. PUTNAM, elected executive vice-president of the Dow Chemical Co., Midland, Mich.

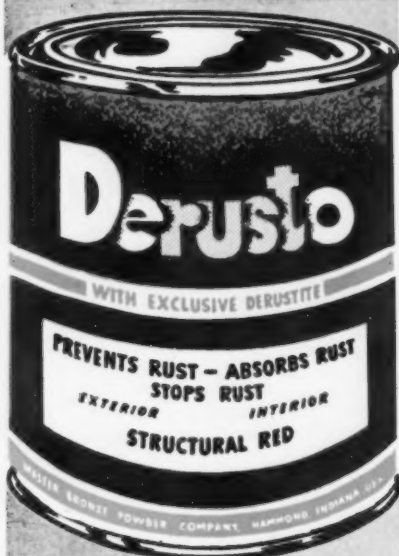


CHARLES R. RITTER, named general traffic manager of Luria Bros. & Co., Inc., Philadelphia.



DELMER Q. BOWMAN, appointed manager of midcontinent operations of the Earle M. Jorgensen Co., Houston.

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Personnel

The Iron Age Introduces *Continued*

Charles C. Buckland, elected a vice-president of MINNEAPOLIS-HONEYWELL REGULATOR CO., Minneapolis. Glenn Seidel has been appointed director of ordnance, Stanley J. Nelson will be superintendent of ordnance. E. H. Salzman, named director of aeronautical administration; M. P. Fedders, manager of aeronautical operations and Howard J. Stoops, director of manufacturing.

W. H. Bolger, advanced to manager of laboratories and Cromwell Bowen to assistant manager of laboratories, ROBERT W. HUNG CO., Chicago.

Joseph Emery Edens, appointed a member of the sales department of LEBANON STEEL FOUNDRY, Lebanon, Pa.

Dr. James F. Eversole, appointed manager of research administration of UNION CARBIDE & CARBON CORP., New York.

Norman T. Harrison, joined JONES & LAMSON MACHINE CO., Springfield, Vt., as comptroller.

Martin Kaufman, heads the new machinery rebuilding division of PRODUCTS ENGINEERING CO., East Orange, N. J.

J. W. Peterson, becomes general traffic manager of AIR REDUCTION CO., INC., New York, succeeding H. W. MacArthur who has retired.

Gordon H. Chambers, named executive vice-president of FOOTE MINERAL CO., Philadelphia. S. C. Ogburn, Jr., named vice-president in charge of research and development; L. G. Bliss, vice-president in charge of sales; and Felix B. Shay, vice-president in charge of production.

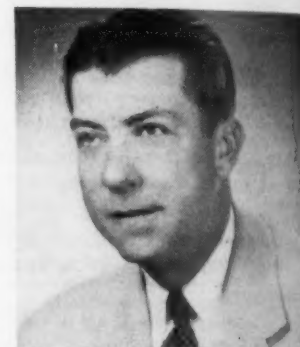
Wilder G. Penfield, Jr., appointed export manager, chemical division of the BORDEN CO., New York.

Charles T. McKinnie, appointed assistant sales manager of PRATT & WHITNEY AIRCRAFT, East Hartford, Conn.

Richard E. McElvain, named to ALLIS-CHALMERS MFG. CO.'s Duluth branch office as a sales representative.



ALFRED E. TREEN, appointed manager of personnel and purchasing, Houston Works of A. O. Smith Corp.



THOMAS G. McNAMARA, appointed chief metallurgist, Alloy Engineering & Casting Co., Champaign, Ill.



WILLIAM ZWICKER, appointed manager, structural steel division, National Steel & Shipbuilding Corp., San Diego.



BENJAMIN A. MAIN, JR., elected vice-president in charge of engineering of Aeroquip Corp., Jackson, Mich.



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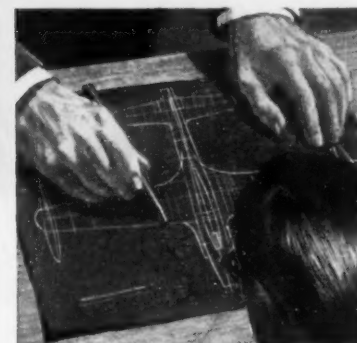
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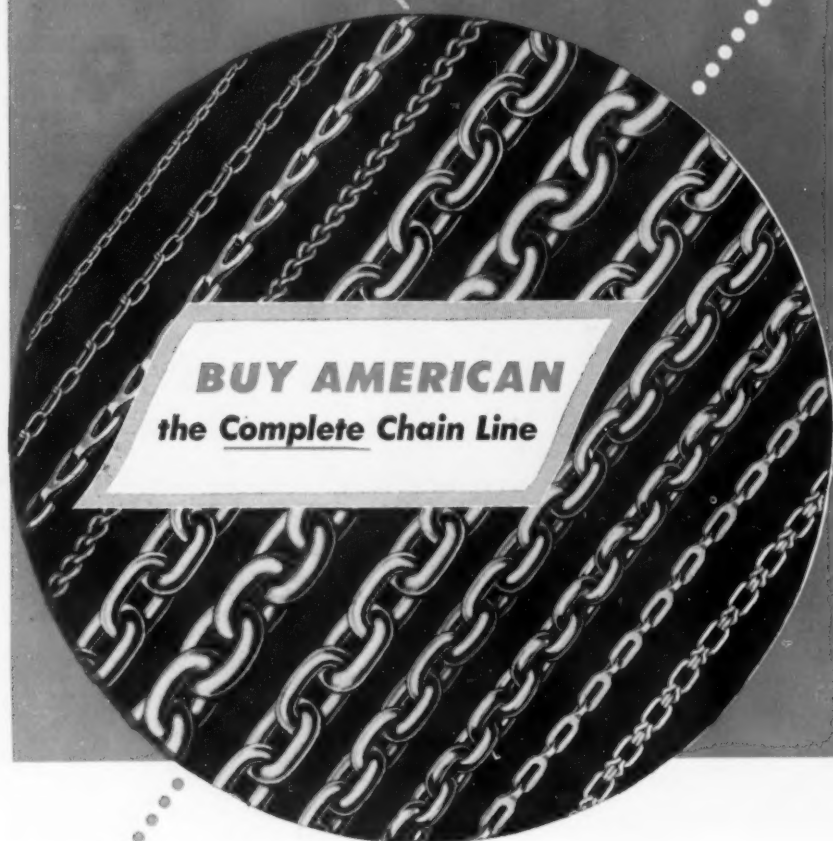


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CHAIN**

The Iron Age Introduces

Continued

E. P. Byington, appointed purchasing agent, gas turbine plant, **LINCOLN-MERCURY DIV.**, Detroit.
H. F. Roberts was appointed purchasing agent of the electrical, chassis, trim and paint department.

G. E. Matter, elected to the board of directors of **JOHN W. HARRIS ASSOCIATES, INC.**, New York.
Ralph Maxwell Immell and **Ivan A. Bickelhaupt** were also elected to the board.

Roy E. Lambert, appointed assistant superintendent by **LINK-BELT CO.**, at their Dodge plant in Indianapolis.

J. Terry Summers, joined **ADMIRAL STEEL CORP.**, Chicago, in the capacity of vice-president.

Maxwell Brace, Jr., elected company executive vice-president and sales manager of the Syracuse branch, for **BRACE-MUELLER-HUNTLEY, INC.** **A. Stanley Vedder** was elected treasurer-secretary, in addition to his present office as treasurer. **Charles A. Bennett** has been made general manager, Buffalo branch.

Herman F. Zorn, appointed executive vice-president of **FERRACUTE MACHINE CO.**, Bridgeton, N. J.

Alan W. Brown, elected president of the **CRO-PLATE CO., INC.**, Hartford Conn. **Robert C. Allen** was elected executive vice-president and treasurer.

OBITUARIES

Henry W. Crosby, 55, chairman of the board of the Crosby Co., Buffalo. Mr. Crosby was the son of the founder of the company.

John C. Phelan, 72, vice-president of the Benjamin Eastwood Foundry & Machine Works, Paterson, N. J. Mr. Phelan had been associated with the firm for 51 years.

Marion F. Crabtree, openheart superintendent, Cast Armor Div., American Steel Foundries, East Chicago, Ind. Mr. Crabtree at 73 was one of the oldest and best-known men still active in the foundry industry.

CARBONITRIDING

on the increase survey shows



By M. B. Bever

Dept. of Metallurgy
Massachusetts Institute of Technology
Cambridge, Mass.



C. F. Floe



W. G. Zaruba

Ammonia Div.
Armour & Co.
Chicago

A survey of carbonitriding practice reveals the process is being used in about 250 plants employing over 400 furnaces. A wide variety of parts are being treated, including stampings, forged parts, machined parts and cast iron. Advantages other than cost savings are having a big influence on the growing use of carbonitriding. A trend toward use of higher temperatures is noted. Continuous and batch-type furnaces were studied.

As evidence of the growing popularity of case hardening by carbonitriding, a careful estimate indicates that the process is now being used in at least 250 plants, employing over 400 furnaces.

This estimate can be made as a result of a comprehensive survey of current industrial carbonitriding practice. The survey was based on information supplied by furnace operators and designers, an extensive review of the literature, and 15 detailed questionnaires completed during personal interviews of men operating representative furnace installations in different industries.

The survey shows that, currently considerations other than operating economies are becoming increasingly important in the expansion

of use of the process. And it is noted that furnace builders are now coming out with furnaces specifically designed for carbonitriding, while in the past carburizing furnaces were used.

A great variety of ferrous parts are currently carbonitrided. Table I lists typical applications of the process in the 15 plants surveyed in detail. These plants are identified by code numbers and the same numbers are used for designation in the subsequent tables.

The presence of nitrogen in the austenite accounts for the major differences between carbonitriding and carburizing. Carbon-nitrogen austenite is stable at lower temperatures than plain carbon austenite and transforms more slowly on cooling. Carbonitriding therefore

Carbonitriding survey (continued)

can be carried out at lower temperatures and permits slower cooling rates than carburizing. Carbon-nitrogen austenite also has a lower martensite transformation range; the resulting retention of austenite varies with amounts of nitrogen present at different depths in the case.

The increase in hardenability of carbonitrided steel permits less drastic cooling rates and the substitution of plain carbon for alloy steels unless the latter are required for core properties. The advantages of lower case hardening temperatures, aside from savings in fuel and maintenance, lie in reduced distortion, the avoidance of cracking, and the possibility of leaving the core soft when this is desirable. The increase in hardenability, restricted to the case, tends to promote a soft core.

A typical carbonitrided case structure formed at 1350°F is shown in Fig. 1. As the temperature of carbonitriding is increased, the thickness of the compound layer formed decreases, while the total case depth increases greatly. A typical structure produced in a continuous furnace with four temperature zones, 1400°, 1500°, 1560°, and 1560°, is shown in Fig. 2. There is no compound layer on the surface, but it is probable that compounds were formed during the first part of the cycle and decomposed at the higher temperatures.

The considerations which may favor the adoption of carbonitriding for a given application may involve the characteristics of the process or the type of case produced. The savings resulting from the substitution of carbon for alloy steel, if core requirements permit this substitution, and the decrease in distortion and the avoidance of cracking are considerable.

In terms of service performance, the combination of core toughness and surface wear resistance is desirable for many engineering applications. Carbonitrided parts on which even a very thin compound layer is formed

usually have an excellent surface finish and are likely to have improved corrosion resistance.

The steels carbonitrided include compositions varying from 10 to 40 points or more of carbon in the AISI 1000, 1100, 1300, 3100, 4100, 4600, 5100, 8600, 8700 and 9400 series. Steels of medium-carbon content are used for applications which require the ability to carry heavy loads as in gears for moderate or heavy duty. At the same time, their higher core strength makes it possible to use thinner cases.

The use of carbonitriding for tool steels has been reported, especially from abroad. One of the installations surveyed carbonitrides cast iron collars. Pearlitic malleable iron castings have been carbonitrided, at least on a trial basis, by combining the malleabilizing of the core with the carbonitriding treatment carried out at 1300°F. Sintered powdered iron compacts have also been carbonitrided.

Many furnaces are continuous

The furnaces used in the 15 installations covered by the detailed questionnaire were built by six different companies. Plants 1 to 9 (see Table I) operate continuous furnaces and plants 11 to 15 batch-type furnaces; plant 10 operates furnaces of both types.

All of the batch furnaces introduce the ammonia at only one point but several of the continuous furnaces have more than one ammonia inlet. If ammonia were introduced only at the charging end, in a long continuous furnace, the ammonia content of the gas would be reduced to an insufficient level by thermal dissociation before the work reached the discharge end. In batch furnaces, especially if adequate circulation is provided by means of a fan, the ammonia concentration throughout the furnace can be controlled by adjustment of the flow of ammonia through a single inlet.

The adoption of carbonitriding is favored by the fact that the process can be carried out in ordinary gas carburizing equipment. In con-



FIG. 1—Case structure formed by carbonitriding for about 6 hr at 1350°F, followed by furnace cooling. Gas composition was 66 pct ammonia, 1 pct methane, 33 pct carrier gas. Specimen surface is at the left. 100X.

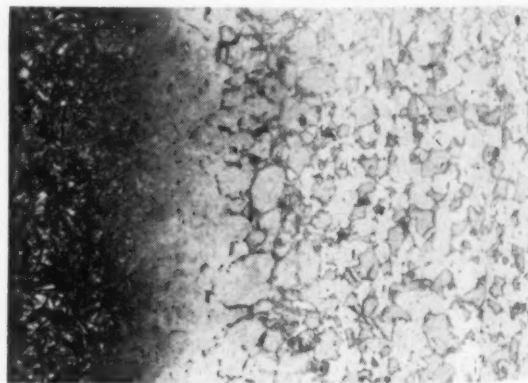


FIG. 2—Case structure produced by carbonitriding in a continuous furnace with four temperature zones at 1400°, 1500°, 1560°, and 1560°F. Gas composition was 25 pct ammonia, 5 pct methane, and 70 pct carrier gas. Specimen was oil-quenched from 1560°F. Surface is at left. 100X.

TABLE I
WHAT THE PLANTS SURVEYED CARBONITRIDE

	Code Numbers*
Transmission gears	10, 13
Shifter forks	13, 14
Shifter rails	13
Steering gear parts	
Worms, gears, shafts, and bearing cups	3
Timing and crankshaft sprockets	8
Oil pump shafts, hand brake levers	11
Clutch release forks	4, 12
Sheet metal stampings	
Washers	9
Spacers	2
Bushings	7
Fasteners	
Screws, cap screws, heavy-duty bolts, flywheel bolts	15
Wheel bolts and nuts	1
Thread cutting and thread forming sheet metal screws	5, 6
Collar bearings	13
Cast iron parts	15

* Plants are identified by the same code number in all tables of this article. A given plant may carbonitride parts other than those listed above, which should be kept in mind when correlating this and subsequent tables.

TABLE II
FURNACE ATMOSPHERES

Plant Code Number	Gas Composition, pct					Total Gas Flow cu ft per hr	Furnace Volume, cu ft**	Approx. Turnover per hr
	Ammonia	Natural Gas	City Gas	Propane	Carrier Gas			
1	13	23	..	..	64	1580	100	15.6
2	33	67	..	..	..	60	24	2.5
3	17	5	..	..	78	1025	370	2.8
4	11	..	17	..	72	900	108	8.9
5	27	..	..	2	71	280	4.5	62.2
6	20	20	..	..	60	250	4.5	55.6
7	16	..	..	2	82	245	..	50.0
8	8	..	12	..	82	1210	46	26.3
9	13	3	..	..	84	715	80	8.9
10a	4	..	8	..	88	625	..	..
10b	2	..	7	..	91	830	..	..
11	6	..	..	1	93	466	40	12.1
12	8	..	6	..	86	520	54	9.6
13	76*	24*	..	..	..	21*	3	7.0*
14	35*	65*	..	..	..	20*	3	6.7*
15	7	10	..	..	83	200	11	18.2

* Hydrocarbon introduced as fluid. Value for atmosphere composition and turnover calculated.
** Estimated in a few cases.

tinuous furnaces it is mainly necessary to assure an adequate ammonia concentration throughout the entire heating zone. Since carbonitriding cycles are usually shorter than carburizing cycles, the flow of work through the furnace may have to be speeded up in the changeover. For the same reason, carbonitriding has stimulated the construction of special batch-type furnaces in which the heating-up period is greatly reduced.

As in gas carburizing, there is a trend toward automatic operation of carbonitriding furnaces. In some installations the entire cycle is controlled by automatic equipment.

The compositions of the atmospheres used in industrial carbonitriding vary greatly, as shown in Table II. The most nearly uniform feature is the use of carrier or generator gas to reduce sooting. It may also decrease the rate of dissociation of ammonia. Carbonitriding can be carried out without carrier gas by using a large amount of ammonia, part of which then assumes the role of the carrier gas.

Table II also shows the total gas flow per hour. From actual or estimated values of the furnace volumes, the hourly turnover can be

calculated. The three furnaces using turnovers of over 50 times per hr are small and have an open charging end so they require large flows of gas to reduce air infiltration. Even disregarding these three installations the variation in atmosphere turnover found has an almost tenfold range.

Furnace design such as the size of the vestibules, the nature and size of the charge, and individual preferences of operators are factors in determining the turnover. One of the small furnaces, having a volume of 3 cu ft, formerly used 150 cu ft of gas per hr but the turnover of 50 times was found unnecessarily high.

Analyses of the atmospheres actually existing at various points in the furnace appear to be almost non-existent. A few analyses of exit gases give dew points of 8° to 16°, 25° to 30°, and 30° to 40°. These last figures seem in accord with a widely held belief that larger water vapor contents can be tolerated in carbonitriding than in carburizing. The practice of analyzing exit gases is uncommon, though it would aid in control of the amount of ammonia needed in inlet gases.

It is desirable as a matter of economy to hold

TABLE III
TIME AND TEMPERATURE OF CARBONITRIDING

Plant Code Number	Continuous Furnaces			Temperature Zones, °F
	Total Time hr	Heating-up Time, min		
1	1	20	30	1550
2	3	..	30	1550, 1550, 1275
3	3	..	105 (to 1400°F)	1490, 1490, 1550
4	..	30	7 to 8	1575-1590
5	..	25 to 45	5	1660
6	..	25 to 30	5	1600
7	..	45	10 (est.)	1575
8	3	12	40 to 45	1550, 1550, 1525
9	..	55	20	1550
10a	2 to 3	..	40 to 50	1625

TABLE IV
TIME AND TEMPERATURE OF CARBONITRIDING

Plant Code Number	Batch Furnaces		Temperature °F
	Total Time	Heating-up Time	
10b	2.5 to 3 hr	50 min	1/4 hr 1625 balance 1550
11	*40 to 50 min **8 hr	20 to 30 min	1475 to 1600
12	2 hr	1 hr	1500 normally 1600 for core
13	2 hr	±1 hr	1500
14	1 hr	15 min	1425 to 1450 for no distortion
15	30 min	10 min max	1500 to 1550

* Stampings and nuts.

** Shafts.

Carbonitriding survey (continued)

the ammonia consumption to the minimum level which is really required. It is also metallurgically sound to limit the ammonia to the amounts necessary for the desired hardenability because in this way retained austenite is minimized. It is of interest that 3 to 4 pct ammonia is sometimes used to produce skin-hardness and even smaller percentages have been found successful in correcting carburizing difficulties such as soft spots.

Tables III and IV summarize the data on carbonitriding time and temperature for continuous and batch installations. In the continuous installations the shortest times used are of the order of 30 min; there seems to be a tendency for the corresponding temperatures to be on the high side of the range. The parts carbonitrided in this manner are sheet metal screws, thread cutting screws and similar items requiring thin cases. Most of these parts have small bulk which is reflected in the estimated heating-up times. Longer cycles in continuous furnaces running to 3 hr or more, while used on such parts as washers and bushings, are mainly applied to heavy parts such as gears, worms, and shafts.

The times used in batch furnaces are comparable to those in continuous furnaces with perhaps some slight tendency towards longer cycles and lower temperatures. In one installation shafts are carbonitrided for 8 hr resulting in a case of 0.032 in.

All of the continuous furnaces surveyed have at least one zone at 1550°F and several of the installations reach temperatures of 1600°F or higher. These figures confirm a trend in carbonitriding practice which in recent years has definitely been toward the use of higher temperatures.

Temperature is compromise

Obviously, the temperature level chosen is a compromise of several factors. Some of the typical advantages of carbonitriding such as avoidance of cracking and reduction of distortion are particularly marked at low temperatures. Also, the rate of useless thermal decomposition of ammonia increases with temperature so that less nitrogen is introduced into the steel. But increased output at a given case depth, and the elimination of the compound layer if it is to be avoided, call for high temperatures. The current trend toward stronger cores also favors higher temperatures.

Some of the continuous furnaces are operated with several temperature zones. The high temperature zone may be at either end. One installation in which the last zone is at 1275°F, followed by slow cooling, carbonitrides sheet metal stampings. The process was adopted by this plant over 10 years ago to reduce distortion. Another plant of the same company car-

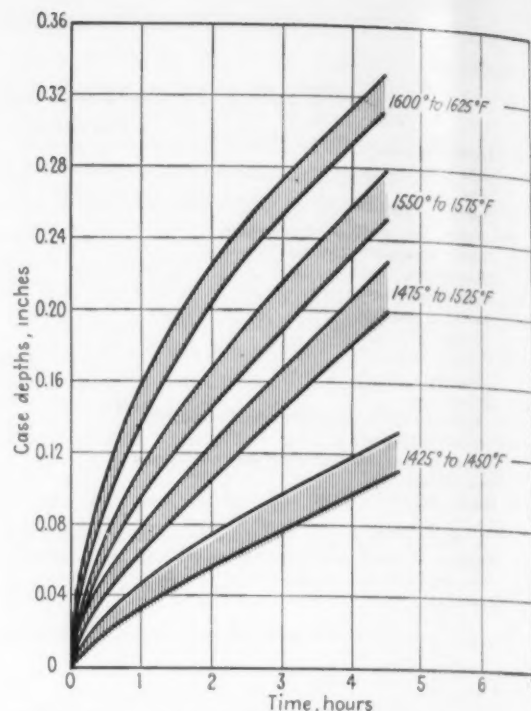


FIG. 3—Case depth plotted against time for various temperatures. Data based on information from about 30 plants.

bonitrides parts, intended for wear service, at 1475° and 1350°F followed by slow cooling. Some of the batch furnaces are also operated at fairly low temperatures, mainly to reduce distortion.

The normal tendency for an increase in case depth with increasing case hardening temperature and time is confirmed by the graph shown in Fig. 3. This graph is based on data supplied by nearly 30 plants covering about 60 different treatment schedules. These data exhibit considerable spread and therefore, in the graph, bands rather than curves are used. The spread of values results from several factors which may cause the uncertainty of the values reported. Among these are differences in definition of case depth and of methods for measuring it and lack of precise knowledge of the length of time for which a given part is actually at the furnace temperature and of the effect of variation of heating-up time. Differences in steel composition and in the surface condition of the parts treated may also affect case depth.

In most installations quenching into oil is employed. Oil temperatures used range from room temperature to 190°F. Some plants attempt close control of the oil temperature to within 5° or 10°F. Water, soluble oil, hot oil and hot salt are also known to have been used. Press quenching of gears is reported and seems to be successful in reducing distortion.

The furnace cooling of steel metal stampings, for example from a final carbonitriding temperature of 1275°F, is typical of a practice aiming at maximum reduction of distortion.

although some hardness must be sacrificed. This practice results in the formation of a heavy compound layer. Furnace cooling or blast quenching after carbonitriding at temperatures below 1450°F are at present carried out on a relatively small amount of work.

The cleaning operations after carbonitriding show little variation. Alkali solutions, solvent oils or other washing compounds are employed and a rust preventative is occasionally used. Some parts are tumbled prior to plating or in order to roughen them before a press fit is applied. Shot blasting to remove burrs is also used. Frequently, carbonitrided parts are not cleaned but are used as they come from the oil quench; this feature of the process can be a substantial advantage from the standpoint of simplifying the flow sheet.

Carbonitrided parts are used in many applications without tempering. Examples of this practice are washers, bushings and ball bearing spacers. For other applications, tempering is necessary to improve the properties of the core or the case. Such applications include gears, shafts and screws. Parts carbonitrided in the higher temperature range are more likely to require tempering. But there is no necessity for tempering parts in which the carbonitrided case consists principally of a compound layer.

Tempering averages 1 to 2 hr

The time of tempering averages 1 to 2 hr; tempering temperatures range from about 300° to 1000°F. The higher temperatures can be used only for cases containing considerable nitrogen. Such cases retain good hardness after tempering for 1 hr at temperatures as high as 1000°F.

Many carbonitrided parts such as washers and screws require no finishing, but close tolerances may call for grinding. A characteristic advantage of carbonitriding is that less grinding is usually required than after carburizing, because of less distortion. This is the principal reason why in industrial experience carbonitrided cases may be thinner than carburized cases.

A surprisingly large number of carbonitrided parts are plated with zinc, cadmium, chromium or copper. Difficulties sometimes encountered may be due to the presence of a carbonaceous deposit which resists removal in cleaning. It is also possible that the presence of the compound layer on the surface makes it more difficult to obtain a good bond. Plating difficulties can also be caused by a superficial oxidation of the work during quenching.

Although one plant reports checking for the compound layer, which it considers a hazard, most plants are not concerned with it and in many instances such a layer is probably not formed. The possibility that retained austenite may be present seems to be recognized widely.

One plant producing an unusually thick case removes the austenite-rich portion of the case by grinding.

The hardness of the case is in some instances reported simply as file hard. Other plants report Rockwell 15-N values ranging from a low of 85 to 91 and even 93. Some plants convert the 15-N readings and on this basis report RC values of from 50 to over 65. Core hardness values range from 25 to 50 RC, depending upon composition and the quenching and tempering practice.

Case depths vary widely

The case depths produced range from 0.003 to 0.020 in. and even 0.032 in. The factors which determine the desirable case depth for a given application include the dimensional tolerances specified, the amount of stock that must be removed to eliminate the effects of distortion, the total allowable wear during the life of the part, the stress concentration in service, and the load-resisting requirements.

One plant reports that carbonitrided cases measuring 0.012 to 0.015 in. have been substituted successfully for carburized cases of 0.030 in. There is a general tendency to reexamine specifications and to reduce case depths wherever possible; the trend toward higher carbon contents of the core improves its strength and permits reduction of case thickness.

In the plants surveyed there is little or no trouble from distortion after carbonitriding. One operator made an exception for higher carbon steels, another reported that distortion of gears had to be eliminated by carefully controlling the temperature of the quenching medium and the case depth.

Carrier gas retards sooting

In installations operated with carrier gas, sooting is successfully prevented or at least greatly retarded. In a few instances, however, furnaces have to be cleaned at frequent intervals. Where plants occasionally change over from carbonitriding to straight carburizing, a special changeover procedure is necessary in order to eliminate the effects of the residual ammonia. The furnace may be burned out by flushing with air or a load of salvage parts may be case hardened in the transition period between carbonitriding and carburizing.

In a fairly large fraction of the plants surveyed the cost position of the process was considered to be very favorable and savings over alternative procedures are reported. Considerations in adopting the process, according to plant managements, were also: Increased production for a given furnace installation, improved case and core properties, and reduced distortion. Also, as a substitute for cyaniding, better working conditions, and elimination of waste disposal problems are claimed.

ROTARY FIXTURES

speed machining

of small castings



By C. S. Treber

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Rotary fixtures speed production and cut labor requirements in machining rocker arms. Most fixtures require loading only; they index and unload automatically. Even the induction hardener is so equipped. Belts carry parts between machines.

LABOR requirements have been cut and production increased through well-designed fixtures on Studebaker's line for machining rocker arm castings. Most fixtures are rotary, loaded by hand but indexing and unloading automatically. This enables full use of the high productive capacity of the equipment used.

Rocker arm castings reach the machining line with scale removed, ready for rapid processing. In this line, the first operation is to grind both ends of a central boss for the rocker shaft in the Gardner disk grinder setup, shown in Fig. 1. All the operator does is to load the forgings into recesses in the disk as it rotates slowly in a vertical plane. Rockers are carried by the disk between two wheels set to give the boss its required length as a result of the grind at each end face.

After passing the grinding wheels, each rocker is ejected and falls onto a belt that conveys it to the next machine, a Rota-Matic. In this 12-station machine the shaft hole is drilled through the boss. Loading is done by hand. Unloading is done by spring ejectors and workpieces are



FIG. 1—Loading rocker arm castings into recesses in disk which carries them between wheels of a Gardner grinder to finish ends of shaft hole boss.

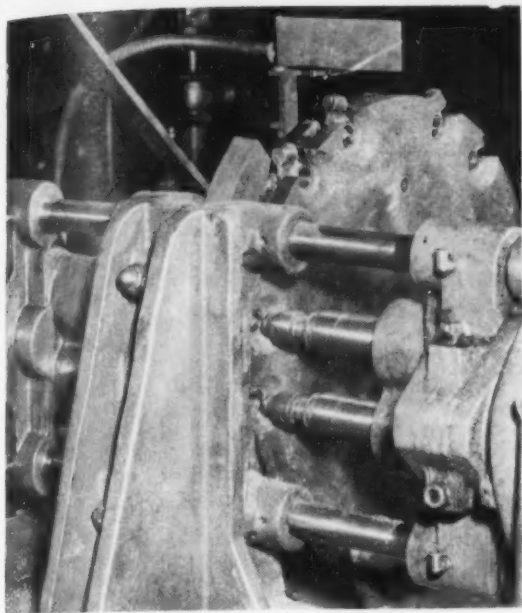


FIG. 2—In this Hartford machine, rockers are set in recesses in indexing disk fixture which positions them for automatic chamfering each end of the boss hole.

delivered by belt conveyer to the Hartford machine shown in Fig. 2 for chamfering the ends of the boss hole.

For this chamfering, rockers are loaded by hand in a slowly indexing vertical disk fixture having holding slots in its periphery. Slots are

a chute so that slots are empty when they are indexed again to loading position. The whole cycle is automatic except for loading the parts.

From chamfering, rockers are conveyed by belts to a Davis and Thompson machine equipped with an indexing drum fixture having locating pins and sets of recesses to fit workpieces at each end. These recesses are loaded by the operator who uses both hands to place one piece in each recess at each end, this being done during the dwell between automatic indexing of the fixture. When pieces reach machining position, the radius on the small end of each piece is milled automatically.

Rockers continue around with the fixture until they fall into a chute and are conveyed to the heat-treating department where they are Roto-Finished to remove all sharp edges.

Rocker arms are next routed to two Buhr machines equipped with indexing tables and four sets of four-spindle heads. Two of the latter are vertical and two, for drilling an angular oil hole, are inclined. One feeds in from the left side, as shown in Fig. 3, and one from the rear. Carried on the indexing table are four duplicate fixtures each made to hold four rockers, loaded and unloaded by hand at the station shown at the right in Fig. 3. Clamping and unclamping are automatic. Location is on horizontal pins through the boss holes.

After loading, the fixture indexes to a station

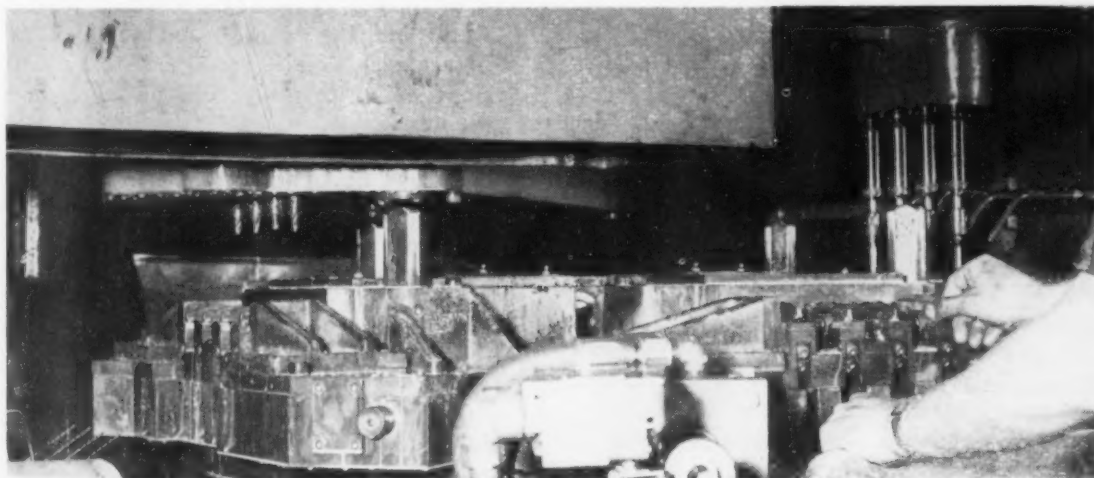


FIG. 3—Buhr machine with 4-plate fixture which automatically indexes parts to machine's four stations for drilling and tapping of oil and adjusting screw holes.

arranged in pairs spaced on the same centers as the chamfering tools. After each indexing a countersink is fed in from each side of the two pieces and withdraws as soon as the cuts are made. Then the next pair in the fixture is indexed to countersinking position as the cycle repeats. When the chamfered rockers reach the bottom position, they fall out of the fixture into

where four angular holes and four adjusting screw holes are drilled. At the next station, drilling of the angular holes is completed. When indexed to the third position, the adjusting screw holes are tapped. At the fourth position, the parts come back to the loading station and are unloaded by hand and dropped onto a belt conveyer. It requires two of these machines to



FIG. 4—This Oilgear broach finishes the boss holes of six rockers in each cycle. After operator loads fixture, balance of cycle, including unloading, is automatic.

keep pace with others in the line though they each process 390 pieces per hr.

Rocker arms are next conveyed to an Oilgear broach, equipped with a 6-place fixture shown in the loading position in Fig. 4. The six broaches are supported by a head that holds them fixed during the cutting stroke. After the fixture is loaded, it is automatically swung to a horizontal position and moved back horizontally until the boss holes come in line with the broaches. At this point, the bed against which the rockers bear is moved upward and, as soon as the broaches enter the holes, the fixture is automatically withdrawn to loading position and is reloaded while broaching proceeds.

Automatic stripper clears broach

When the workpieces, after being moved upward, clear the broach cutting lands, the broaches are freed by the upper head. It is elevated to clear their upper ends while the lower ends of the broaches, projecting through the bed, are supported by a cross arm below the bed. An automatic stripper then pushes the workpieces off the top ends of the broaches. They drop into a chute and slide onto a belt that elevates them to an inspection bench.

When the broaches are cleared, the upper head lowers, picks them up and elevates them to a position where they are held as the next broach-

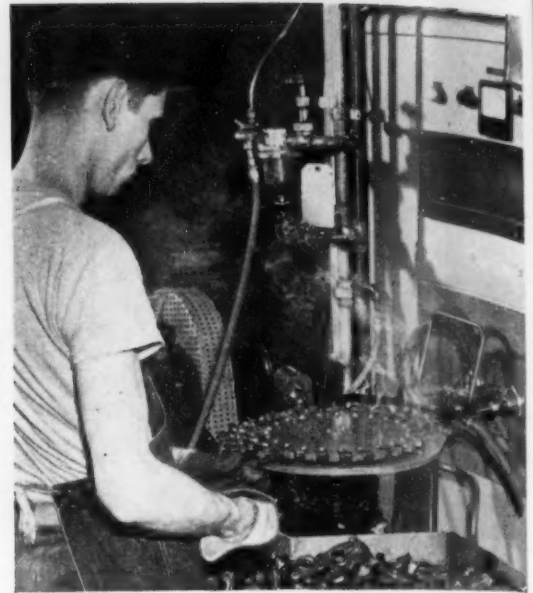


FIG. 5—Rotating fixture carries rockers under coil of this Reeves induction hardener. Ejection into a quench tank and unloading from tank into tote box is automatic.

ing of a new set of six rockers starts and the cycle repeats. This entire machine cycle is automatic and the operator has only to load the fixture each time it rocks back to loading position. With this setup, 1100 pieces are broached per hr.

Induction hardener used

Broaching completes the machining of rockers but those that pass inspection have the milled end hardened before the rockers are ready for assembly. Hardening is done in the Reeve Electronic setup, Fig. 5, that includes a slowly rotating horizontal disk fixture. This is provided with radial slots in each of which a rocker arm is inserted with its inner end under a spring.

All the operator does is to load a rocker in each slot, taking the workpieces from the bin shown. The fixture is timed to handle 1150 pieces an hr. As the disk rotates, it carries the outer end of each rocker between the arms of the hairpin shaped induction coil which is a water-cooled copper tube.

After passing under the coil, each rocker is knocked out of the slot automatically and drops into an oil quench tank below. In the tank, rockers fall onto a cleated woven wire belt that elevates them and permits oil to drain off before the rockers are deposited in a tote box.

Accurate stampings made at high production rates



By Herbert Chase
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Torque converter shells, shrouds and blades are stamped at high production rates by Ford, yet are held to precise dimensions. Unusual cam-operated punches produce blade slots. Accurate, burr-free blades are produced at rates of 140 per min. Dieing machines also produce detent levers at high rates.

High production is combined with great accuracy in production of stampings for the Ford automatic transmission at Ford's new Cincinnati plant. Though good design has kept the stampings as simple as possible from a production standpoint, some of them are necessarily quite complex and present unusual problems. And the typical auto industry standards of high production and accuracy are not easy to meet on stampings of this nature.

Stampings for the rotary torque converter are of primary interest because they are the heart of the unit. They must be made within exceedingly close dimensions to assemble properly, yet blades require few or no secondary operations.

Each transmission includes the rotating elements shown in Fig. 1. Those at the top are aluminum die castings and have cored slots for stamped blades. Blades are nearly flat, except for blisters raised on the ears to insure tight fits in the slots. Height of these blisters is held within ± 0.001 in. but, otherwise these particular blade stampings are quite simple.

Other large parts and partial assemblies shown in Fig. 1 are completely stamped. Two are annular rings or shrouds having a roughly



FIG. 1—Top, diecastings for Ford automatic transmission torque converter. Unit at right has stamped blades in place. Shroud rings and shell are stampings. Shell, second row, right, has some stamped blades in place.

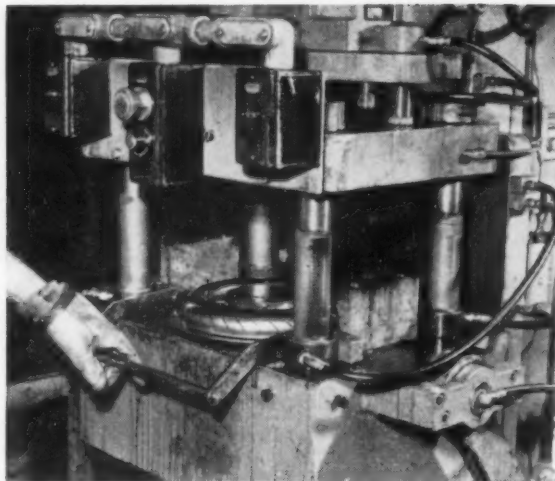


FIG. 2—Setup for piercing blade slots in shroud ring stampings. Die is shown open. It is closed by lifting lower half with air cylinder. Each ram stroke pierces two slots. Indexing between strokes is automatic.

semicircular section but with differences in piercing. Another called a shell has three sets of pierced slots. All three of these parts are drawn in fairly conventional dies. They must hold close limits on diameters and sectional shapes.

After the shrouds and the shell slots are pierced, they receive blade ears that subsequently are rolled over to anchor the blades. These slots must be closely held both as to dimensions and spacing. Slot location is such that these openings cannot be pierced simultaneously by punches moving parallel to the axis of the piece. Even if a single multi-blade punch could be provided, it may be doubted that such a setup would work without excessive down time for keeping the individual punches in order.

Actually the slots are pierced in indexing die setups like the one shown in Fig. 2. Each such setup uses either two or three punches arranged to be moved positively but separately at such an angle that the direction of motion is normal to the work. As the punches do not move parallel to the press ram, a cam action is required. Punch holders are slotted parallel to their axis. A cam is reciprocated in such a way that a punch blade in each slot is forced through the stock on the down stroke of the press and is positively returned by the cam on the up stroke.

With this arrangement, the work piece is always set into the holder horizontally but the punches are moved at an angle between vertical and horizontal. The slug falls down through an opening in the die and cannot interfere with loading and unloading of the workpiece.

Although dies are applied to 25-ton V & O presses and punches respond to ram motion,

the punches are not carried by the ram but move in holders reciprocated in guides that are parts of the fixed upper die. Lower halves of dies are movable vertically on guide pins by an air plunger but are lowered only for loading and unloading. When the work piece is loaded, the operator moves a lever and the lower die is elevated by the air ram, thus positioning the work piece between the two halves of the die.

Friction drive indexes die

When the die halves and work piece are positioned, the press ram is reciprocated and causes the punches to pierce holes on the down stroke. As soon as the punches clear the work on the up stroke, the work piece is indexed for the next hole and comes to rest before the punches are returned on their next working strokes. Indexing is done by a friction drive below the lower die. The indexing plate has detent notches equally spaced around its edge and the detent moves into each notch in succession to positively locate the disc and the workpiece.

Presses operate at 150 rpm; each punch pierces one slot per revolution. There are 33 slots per set, so 33 strokes are required to complete the piercing. Allowing for loading and unloading, 108 to 132 stampings per hr can be pierced. The press stops automatically when the set of holes is completed. On shrouds, one man operates two presses, one being unloaded and reloaded while the other runs through its cycle automatically.

Spacing between holes is held within ± 0.0025 in. Microswitches are so arranged that the press cannot operate when the die is open. Indexing is so precise that, if a piece that has been run and completely pierced is rerun without removal from the die, the punches merely enter holes previously pierced without removing additional metal. Punches are kept in first class condition and cut so cleanly that practically no burrs are left.

Turbine blades stamped

Another important stamping job is the production of turbine blades. This is done in a 100-ton Henry & Wright press or dieing machine. Although this press uses an 8-station progressive die and handles 0.042-in. coil stock $5\frac{3}{4}$ in. wide, it runs at 140 rpm and produces one completed blade per working stroke. Dies are made from air-hardening tool steel and are kept sharp and well lubricated. Hard plated bushings on ground guide pins help to maintain precision.

Study of the strip of stock taken from this die shown in Fig. 3 gives a good idea as to the operations performed. Much of the contour is blanked at the first station but the leading and trailing edges are blanked at the second station leaving the work piece fastened to the strip only by a central ribbon of metal. It is important that burrs be kept at a minimum at

all points especially at the leading and trailing edges. This accounts for striking the blade a coining blow along these edges at the third station, leaving marks visible in Fig. 3.

As these blades have to be given a rather deeply curved shape, forming starts at the fourth station and is continued at the fifth. Restrikes at the sixth and seventh stations help to set the shape before the work piece is sheared free of the strip and drops out of the die at the final station. Die regrinding is done with great care and under instructions that no more than 0.0002 in. of metal be removed per grind. As many as 900,000 pieces have been produced between grinds.

No further die work is done on these blades, which go directly to assembly. There, blade ears are inserted by hand in slots of mating components, after which the ears are rolled over in an assembly fixture to permanently lock the blades in place.

circular punch but the hole is subsequently enlarged to the elongated shape after forming operations on the piece are completed. The punch used for the second piercing is under-size across the flats at its lower end so it produces an undersize hole. Above the end of the punch, however, is a step that brings the hole to size as it performs a shaving operation on both flats. It is this operation that holds the close limits and also produces a smoother surface on the flats than the lower end of the shearing punch leaves.

The smaller hole in this piece near the opposite end from the larger hole is pierced after the offset forming is done so that center distance between holes will not be affected by the forming. In the final operation, the work piece is sheared from the strip and falls through the die.

Among other interesting stampings is a hat-shaped part termed a pilot. This is rather

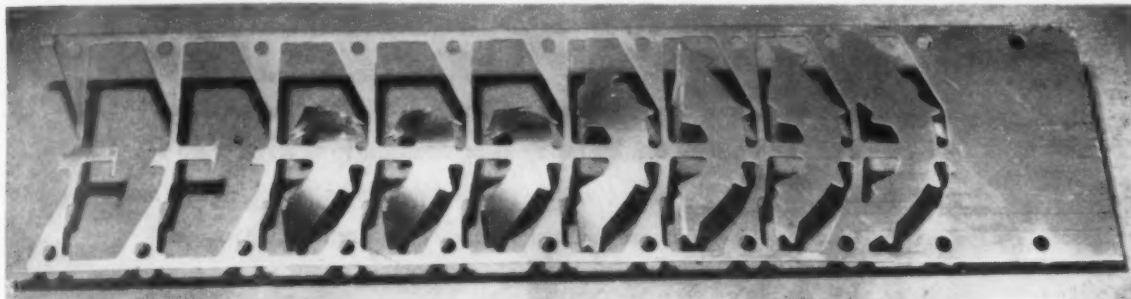


FIG. 3—Strip from 8-station progressive die in which blades are sheared and formed at 140 per min.



FIG. 4—Strip from 12-station progressive die in which detent levers are produced from 0.150-in. stock.

During initial stages of production, blades dropped from this die were handled in tote boxes, but this gave rise to some damage. In consequence, special guide troughs have been developed and are so applied that the blades automatically stack themselves and are fed into similar handling troughs in which they are delivered to assembly.

Another stamping produced in a 100-ton Henry & Wright machine using a 12-station progressive die, is a detent lever. A strip from this die is shown in Fig. 4. Stock used for this part is 0.150 in. thick. Partly because of the heavy stock, there are several blanking stations. The large hole is elongated and the distance between the flats at each side has to be held within ± 0.0005 -in. limits.

Piercing of this large hole is started by a

deeply drawn considering its size for 0.150-in. thick stock. Drawing is done in a 5-section transfer die using a reciprocating frame to effect the transfer. This die is used in a 1000-ton Clearing press which is needed for other work. Otherwise a 250-ton press of suitable bed dimensions could be used.

Blanks are circular and are fed automatically from a magazine loaded by hand. The only satisfactory die lubricant found is a dry wax called Drycoat. For convenience, it is applied wet to the blanks. By the time the work piece has reached the third station, however, the heat generated has caused the coating to dry and become solid so that it works well where its dry qualities are needed.

This press makes twelve working strokes a minute—one complete stamping per stroke.

How **WELDING** salvages broken

TOOLS and DIES



By L. D. Richardson

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Materials shortages make it imperative that broken or worn tools and dies not be ignored. Often they can be repaired or adapted to other uses with the aid of welding. If entirely unusable, they're still valuable as premium-priced scrap. A tool salvage program can save time, money and critical materials.

An intelligent tool salvage program will save any shop money. It can also save important time by returning repaired tools and dies to use faster than a new piece could be obtained. In these days of critical shortages of steel alloying elements like tungsten, tool and die salvage is doubly important.

Broken or worn tools and dies can often be salvaged by repairing them, or adapting them to other uses. Welding plays an important part in such salvage operations.

The first step in a salvage program is to go through the shop systematically, collecting every scrapped tool bit, die, milling cutter, or

other piece of tool steel. These can then be processed on one of several ways so that the critical alloys they contain are returned to circulation and utilization.

If absolutely no other use can be found for obsolete or scrapped tools they can be sold to melters or steel mills, which pay a premium price for high-alloy steel scrap. One Pennsylvania firm, conducting a drive, recently turned up nearly 10,000 broken or worn drills, reamers, countersinks, boring bars, and other tools. This was a big corporation, but even the smallest machine shop will have a goodly supply of unused tools. If all shops get together and clean

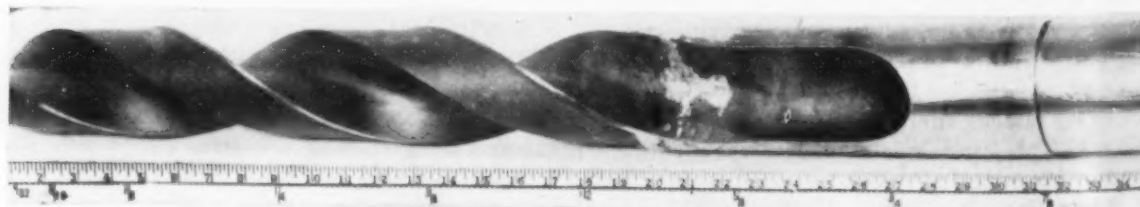


FIG. 1—A three-inch drill successfully repaired by welding.

house, it will be of tremendous help to national defense.

But before tools are sold for scrap, they should be carefully analyzed to determine if they can be salvaged and re-used. Or if this is not feasible, some can be cut up and used for the tipping of plain carbon steel shanks or bases. Often such a program has saved a company considerable expense and waiting time in procuring urgently needed tools, while at the same time reducing the demand for tungsten.

Since World War II, new joining alloys have been developed and carefully tested. They are now in use by many of the leading tool and die users. This article reviews methods and procedures of tool conservation prepared by Eutectic Welding Alloys Corporation which are in use by leading metal working industries.

Fig. 1 shows a 3-in. drill, which had broken right through the flutes. It seemed destined to be scrapped. But welding the drill to salvage it was attempted. First, both broken sections were carefully cleaned and degreased, then fluxed, after which a thin layer of EutecRod 16FC was applied to both areas. Following this "buttering" preparation, the two pieces were pressed together and heated at the joint area just enough to remelt the thin skin of alloy in between.

Service Proves Welded Drill OK

After cooling, the drill was returned to service, being only a few thousandths of an inch off center. Despite heavy-duty operation, this drill has been in use continuously, without failure in or near the weld zone.

Improper feeding of stock had caused an entire section to break out of the milling cutter shown in Fig. 2. Instead of simply throwing the cutter away welding was resorted to. As can be seen in the photo, the broken out section has been carefully welded back into place, and the cutter, after resharpening, is ready for use.



FIG. 2—Torch welding put this broken milling cutter back in use. Repair of tools conserves high-alloy steels.

Welding hack-saw blades might not be considered economical, and under ordinary circumstances, one might readily throw a broken one away. In these times, however, when every little bit of high-alloy steel is worth its weight in gold, whatever can be saved must be saved. So even the lowly hack-saw blade assumes new significance; especially so if it is a special size or type which cannot readily be replaced. When a saw breaks, the two broken sections can be joined with the same method used in repairing the drill in Fig. 1.

Arcwelding Repair Often Preferred

The rod used in these cases is a thin-flowing, high-strength alloy for torch joining. However, in many cases of tool salvage, the use of the torch is objectionable or impractical. Especially when larger units have to be repaired the arc is usually preferred, since it offers much more concentrated heat and by completing the weld more quickly runs less risk of annealing the tool or cutting edges.

Saving the die shown in Fig. 3 presented quite a challenge. When an oversize sheet of steel was fed into the press, the entire nose of the die broke off, approximately as shown by the dotted line. Since welding the broken section back into place would have presented more difficulty and would have taken longer than simply building up the die and grinding it back into shape, the latter alternative was chosen.

Using a 3/32 in. electrode, EutecTrode 6 HSS, the missing portion of the die was rebuilt. No preheating facilities were available, so that the electrode was used cold. Also, in order to keep the heat input into the die at a minimum and thus avoid the danger of warpage, distortion or residual stresses, several short beads were deposited. Each pass was peened, and the die allowed to cool between passes. The die had been in use for several weeks by the time the photo shown in Fig. 3 was taken.

Shortly after it was put into operation, two large sections broke out of the die shown in

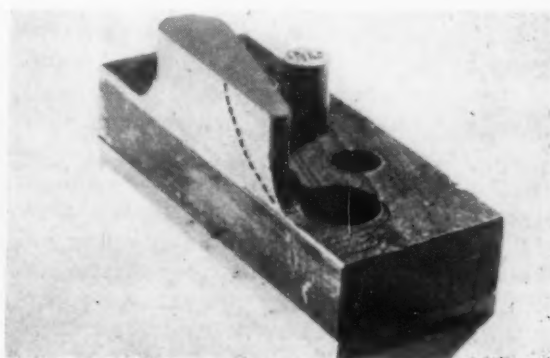


FIG. 3—The corner of this die broke off as indicated by the dotted line. Instead of welding broken corner back on, it was replaced with built-up weld deposits. Photo was taken after repaired die had been in use for weeks.

Welding broken tools (continued)

Fig. 4. To repair, the broken die was ground to form a smooth, clean beveled edge. Then a series of layers of EutecTrode 24 were deposited until the missing sections were completely filled. In this case the weld deposits had to be fully machinable, since a hole had to be drilled and tapped right through each built-up section. This was readily accomplished as shown in the photo, without encountering any hard spots.

Two cracks, extending from the keyway out to the very edge of the slitting saw shown in Fig. 5 had doomed this tool to the scrap heap. Welding, however, saved it. The cracks in the saw were first veed out a little. Then a plate, larger than the saw, was heated to about 400°F, and the saw clamped to it. The saw was thus preheated uniformly. EutectoMask was painted on the area adjacent to the weld to protect it

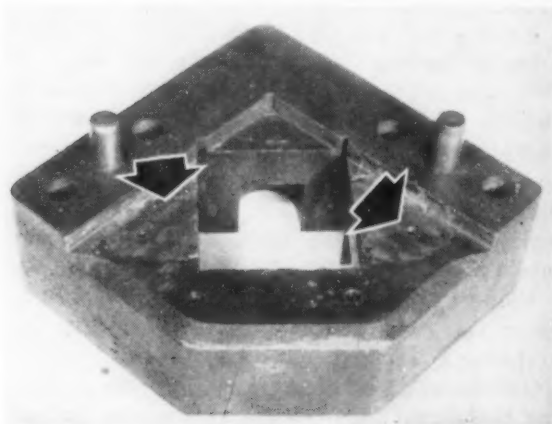


FIG. 4—Arrows indicate where two large areas broke out of this die due to too-strong pushout springs. Sections were replaced with built-up weld deposits.

against spatter. Then, using 3/32 in. EutecRod 68 the crack was welded up first on one side, then on the other. A skip-welding technique was employed, and never more than 1/2 in. of bead was deposited, all in an effort to keep the heat in the saw at a minimum. After completion of the welds, the cutter was ground, and then returned to service. A perfectly welded saw was the result, without annealing any of the teeth.

Repair of broken drills, reamers, and milling cutters is only one phase of tool salvage. Conversion is equally important. Converting old high-speed steel tips for all types of turning, boring, or parting tools represents an opportunity for a shop not only to conserve critical metals, but also to slash tooling costs.

As an example, assume a shop has several thread chasers worn beyond repair. Instead of scrapping them, they can be put to good

use. Pieces can be cut out for tipping cut-off, turning or boring tools.

A broken high speed parting tool will serve as a second example. First, the tool is cut up into several usable sections, each one long enough to be forged into a tip for another parting tool. These tips are then joined to carbon steel shanks, so that instead of only one parting tool, two or three such tools have resulted. The small broken tip of the original tool, which has been cut off, is sold for scrap.

Joining high speed steel or tungsten carbide tips to carbon steel shanks is a very simple operation, as is shown in Fig. 6. It is not always necessary to form-fit the shank to accommodate the tip. In many cases the tip can easily be lap-joined to the shank on one face only, with more than enough strength of joint to withstand the shocks of heavy-duty operation.

Actual joining consists of these steps: Both shank and tip are properly degreased and

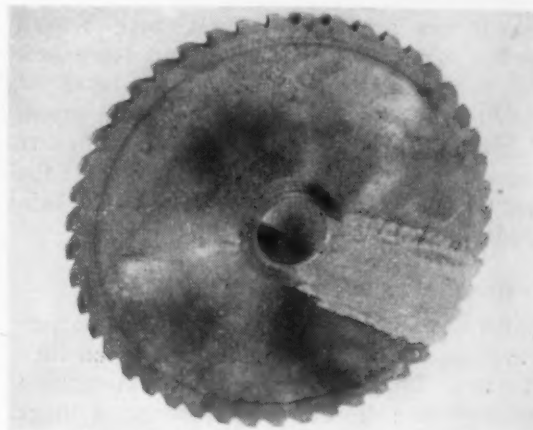


FIG. 5—Slitting saw repaired by welding. Two cracks, extending from keyway to teeth, were welded. Skip-welding kept heat to minimum so there was no annealing of teeth.

cleaned, then fluxed on all the edges to be joined. The tip is then dipped into powdered EutecRod 16, so that almost automatically just the right amount of welding alloy needed is picked up. The tip is then placed in position, and if possible slight pressure is brought to bear in order to keep the clearance between shank and tip to an optimum value of about 0.003 to 0.005 in.

Using an oxyacetylene torch adjusted to neutral, the tool shank is then heated until the flux and alloy melt. It is particularly important to heat in this manner allowing the heat to be conducted from the tool shank into the tip, since this will obviate any danger of overheating or cracking the tip. When the joining alloy has become thin-flowing, the tip should be pressed down onto the shank with a metal rod which has been heated to avoid sudden chilling of the tip and the risk of cracking it.

As soon as the joining alloy has melted and formed a thin fillet all around the joint, heating is stopped and the tool allowed to cool.

The same joining alloy was used to fabricate the ingenious clay cutter, using a mild steel disc and welding a series of tungsten carbide cutters to it. Not only does this approach reduce the amount of high alloy steel needed, but it also cuts the amount of machining necessary to almost nothing. Grinding-sharpening is about the only operation needed after welding is completed.

Often the need arises for a certain size tool, other than standard; and delivery on special tools usually ranges from a few weeks to a month or two. In such instances it has been found that it is much more economical to have the welding shop adapt the tool from standard parts. If, for instance, a reamer is needed to ream an extra-deep hole, it is a simple matter

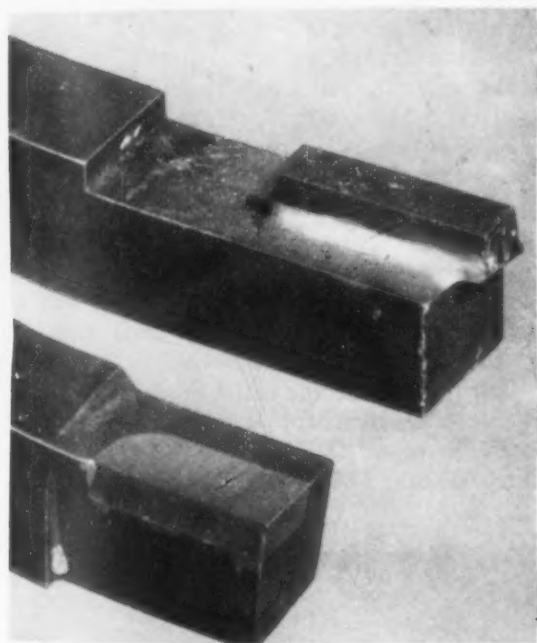


FIG. 6—High speed steel or tungsten carbide tips, formed from scrapped tools, can be welded onto carbon steel shanks to make new tools. Though shank at top was not formed to accommodate the tip, as shank at bottom was, the tool is strong enough for even heavy-duty work.

to weld on a length of carbon steel shank to a standard reamer. Similarly, if a set-up on a milling machine is such that the work, when raised to cutting height, interferes with the arbor, end mills are used which do not necessitate the use of the arbor or arbor support.

Just such a dilemma recently faced a small machine shop in the East. A plain milling cutter of special width had been ordered, but in setting up the machine it had been found that this type of cutter could not be employed because the arbor interfered with the work.

To scrap the cutter and order an end mill type would require additional tool expense and time would be lost in waiting for it. Instead, a special arbor was turned down in the shop to fit the taper of the milling machine head, on one end, with an OD the same as that of the standard arbor on the other. The milling cutter was then placed onto the special arbor, and joined to it with EutecRod 16.

A thin layer of this alloy was first applied to both the arbor and the inside of the milling cutter. Next, milling cutter and arbor were assembled in the proper position, flux was applied, and with an oxyacetylene torch the joint area was heated only enough to flow out the joining alloy once again. By directing the flame of the torch against the arbor, and allowing the conducted heat to flow out the alloy, the heat in the cutter itself was kept to a minimum, and no annealing was encountered.

These examples only scratch the surface. Many additional applications of welding have not even been touched. Replacing broken tangs of drills and reamers by building up; overlaying mild steel shanks with hard alloy to make a tool with a hard, durable cutting edge, and many other uses to which welding can be successfully put in the machine shop could be quoted.

NEW BOOKS

"*Retire and Be Happy*," by Irving Salomon, offers practical assistance and sympathetic understanding and comfort to the man contemplating—or worrying about—his retirement. It is written by a man who, himself, is retired and it contains the reflections and case histories of 405 other retired men from all income brackets. The author deals with the importance of careful planning for retirement, misconceptions that surround the idea of retirement, what retirement can do for a man, the proper age for retirement, health, hobbies, philosophy, how to make a success of retirement, and the wife's place in retirement. Greenberg, Publisher, 201 E. 57th St., New York 22. \$2.95. 206 p.

* * *

"*Welding, Joining and Cutting of Gray Iron*," by C. O. Burgess, is the second of a series of three technical manuals on gray iron castings. New processes and improved techniques for successfully welding gray iron are described. The advantages of welded fabrication are extended to gray iron components. Subject matter includes gas, arc, inert-gas, braze-weld, brazing, thermit, flash welding, etc. The processes open up new design possibilities for successfully joining gray iron to other metals, and facilitate repair and maintenance operations. Gray Iron Founders' Society, Inc., 210 National City-E 6th Bldgs., Cleveland 14, Ohio. \$1.50 (\$1.00 to GIFS members.) 40 p.

British CONTINUOUSLY CAST



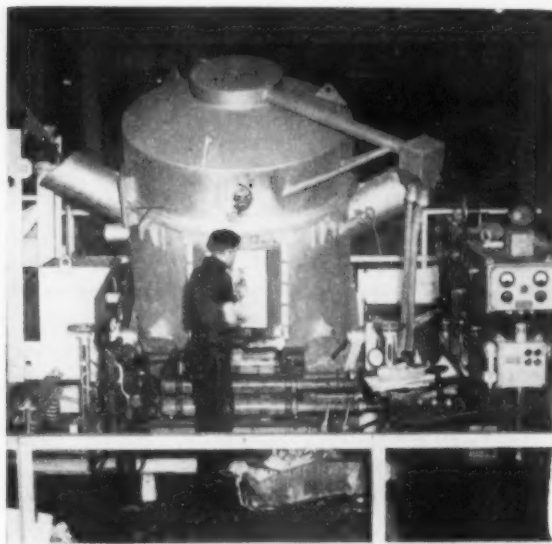
By
D. I. Brown
Technical Editor

Aluminum sections up to 9 in. in diameter and slabs up to 10 in. x 48 in. cross-section are now being continuously cast in Britain. This Rossi machine started production in June. The British report that the quality of the new product is superior to that made by conventional methods.

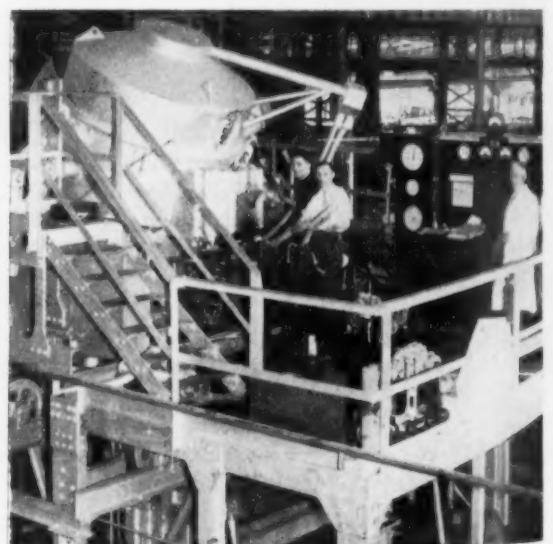
ONE of the most recent Rossi continuous casting installations is the machine for casting aluminum and aluminum alloys at the Waunarlwydd works of the Imperial Chemical Industries, Ltd., in England. This is one of the largest continuous casting machines yet erected, both from the standpoint of size of casting and

size of the machine. This machine is designed to produce castings up to 20 in. in diam. and slabs up to 10 in. x 48 in. in cross-section.

The I. C. I. machine is not the first attempt at casting aluminum and aluminum alloys by the Rossi process. During War II, machines at James Booth, Ltd., Birmingham, England, and



FRONT VIEW of the British casting machine showing molten aluminum being delivered to the holding unit. The top of the holding unit is electrically heated. At the right is the control board. The top of the mold is directly under the operator's hands, center.



CASTING PLATFORM at the new installation of Imperial Chemical Industries, Ltd. Immediately under the casting floor are located the water sprays for cooling the cast sections. The pinch rolls which guide the bar down to the ground level are located under the spray area.

large aluminum sections

Extruded Metals Corp., Grand Rapids, Mich., produced many tons of aluminum alloy for fabrication into structural parts for the aircraft industry of both countries. The Booth machine is now idle for lack of metal and the Extruded Metals machine was reconditioned and is now producing commercial copper (OFHC) at the United States Metals Refining Co., a subsidiary plant of the American Metal Co., Ltd.

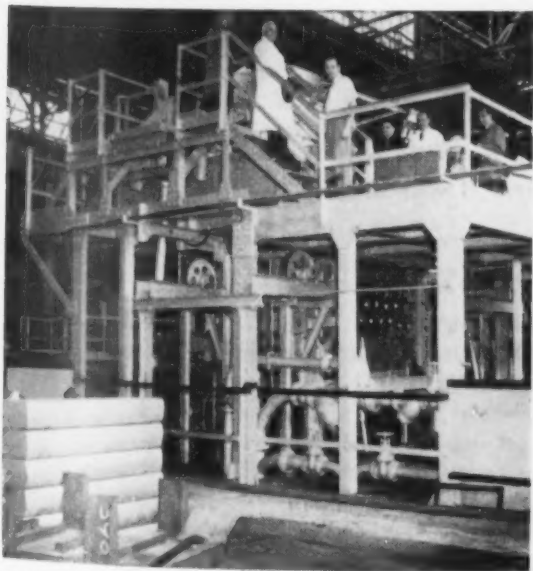
These machines have cast such alloys as 2S, 3S, 14S, 17S, 24S, and 61S with excellent results. Surface exudations, bleeding, prevalent in casting most aluminum alloys, are eliminated to a great extent in the Rossi process of continuous casting, and whatever surface imperfections are present require only a minimum of surface conditioning before further processing. Castings of 2S and 3S aluminum require no surface conditioning whatever and may be rolled directly to thin gage strip.

The I. C. I. machine was put into operation shortly after the first of the year at which time the first acceptance tests were completed on the casting of round billets. The acceptance tests for rectangular slabs were completed in June of this year.

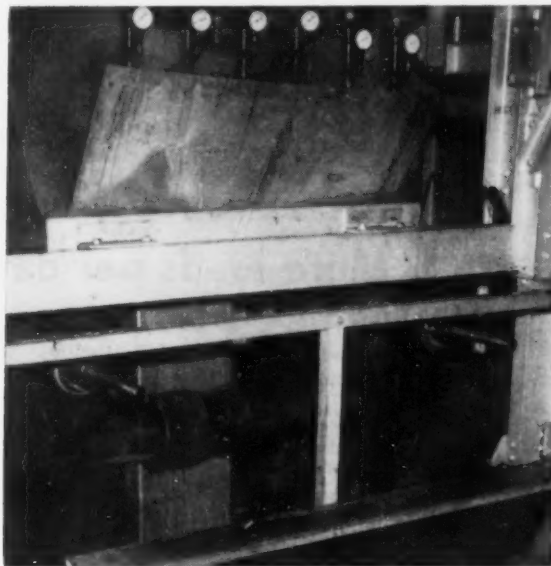
Following the basic design of the Rossi machines, the Loewy Engineering Co., Ltd., of Bournemouth, England, engineered, fabricated and erected the machine in the I.C.I. plant. From the accompanying photographs it is evident that much planning went into this machine. The control and instrument panels are complete in every detail and are located within easy reach and sight of the machine operator.

Similar to U. S. practice

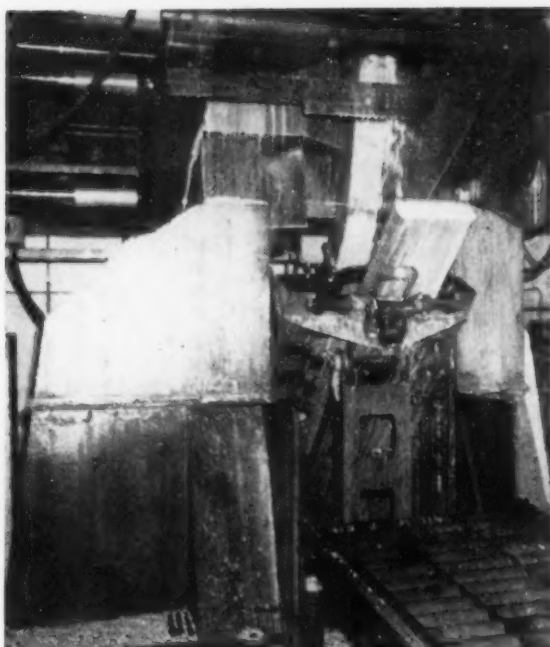
The molten metal from the melting furnaces is brought to the holding reservoir in ladles in very much the same way as is practiced on the brass machines in this country. The reservoir in which the metal temperature is controlled thermostatically can be tilted and is brought into pouring position through hydraulic cylinders. The downspout, constructed of cast iron, is fashioned in much the same manner as that described in the articles on brass and copper which appeared in the previous two issues of *THE IRON AGE*. Lubrication is secured through the use of vegetable or animal oil to the mold wall. An inert atmosphere of hydro-carbon gas is



PLANT FLOOR serves as the second level. The water sprays can be seen under the 12 in. long mold. At the left are production slabs of 7 in. x 21 in. size which were cast at 10 to 15 ipm on this machine.



PINCH ROLLS which grasp the descending cast slab are controlled automatically by casting speed from the control panel on the casting floor. Notice the individual gages on each of the water spray lines.



CUT-OFF SLAB being delivered to run-out table. This discharge basket can handle rounds or slabs. Standard cutoff assembly is used with horizontal or vertical saw.



CONTINUOUS CAST SLABS of aluminum 7 in. x 21 in. shown on the run-out table. These slabs are only 42 in. long. The machine can produce slabs to a max. length of 12 ft.

Continuously casting aluminum (continued)

maintained over the molten metal to preclude oxidation.

The molds are machined from solid copper with internally drilled coolant passages. Auxiliary sprays are suspended directly below the mold for additional cooling and may be set for the intensity of cooling desired.

The mold reciprocation is accomplished in the same manner as that on any Rossi machine. One set of withdrawal rolls is used and they are synchronized with the oscillating mechanism through P. I. V. units.

The cut-off assembly is of standard design using a saw mounted on vertical and horizontal guides. The discharge equipment, large in structure to accommodate the huge castings, is

designed to receive either the slabs or rounds. A roll-out table takes the cut off lengths, from which they are lifted out by crane to inspection tables.

Quality-wise, Rossi continuous cast aluminum ingots are superior to those cast by conventional methods. In addition to the minimization of exudations, there is a minimum of segregation, no oxidation of the metal, consequently no oxide particles in the solidified casting, an absence of shrinkage cavities, and a uniformity of product.

Since the I. C. I. machine has been in operation for only a short time, there are not complete data regarding its operation. However, with the completion of the acceptance tests, it is expected that with experience and the development of new operating techniques, tonnages will increase, product uniformity will become established and greater economies will be realized.

More loads per day with your fork truck

Hoisting speeds of fork trucks, a critical consideration where large volumes of pallet-loaded materials must be moved quickly each day, can be increased by boosting the voltage of batteries used. Speeding fork-truck operations results in appreciable savings. Often overlooked is the fact that similar fork trucks can have different hoisting speeds.

The critical considerations here are not so much weight and operational capacities of the truck, but rather the rated voltage of the power source. Because lifting speeds of battery-powered fork trucks are almost directly pro-

portional to the impressed voltage for a given load, higher voltages provide faster lifting speeds. Hoisting-speed increases of 15 to 20 pct by this method are not uncommon.

A 5000-lb truck, powered by a 30-v industrial battery, has average hoisting speeds of 29 fpm with empty forks and 14 fpm when loaded to capacity. Powered by a 36-v battery, the same truck can lift its unloaded forks at a speed of 34 fpm and capacity loads at 18 fpm, a hoisting-speed gain of approximately 17 pct. Similar possibilities exist for larger and smaller industrial trucks.

FREE publications

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Fuel-air ratio control

Control of fuel-air ratio in metallurgical furnaces is discussed in a new 4-p. leaflet. Systems covering metered control for both single and dual-fuel furnaces are discussed. Use of the metered fuel-air ratio control system is overcoming many problems encountered in maintaining efficient and economical fuel use. Minneapolis - Honeywell Regulator Co.

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New plating literature

Several new bulletins and booklets for the electroplating industry have been issued. They cover iron, zinc, chromium and plating in the graphic arts. Titles are: The Electrodeposition of Iron; Technical Instruction on S-B Process for Zinc Plating; Engineering for Electroplating in the Graphic Arts; H-VW-M Chrom-Flo Anode Bulletin CFA-100. Hanson-Van Winkle-Munning Co.

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Shielded arc welding

A new 19-p. booklet, *Nickel-Molybdenum-Vanadium Alloy Steel Shielded Arc Welding Electrodes (Low Hydrogen Type)* has been issued. This reprint summarizes investigations by welding specialists of the Industrial Test Laboratory at the Philadelphia Naval Shipyard on results obtained with commercially available rods. International Nickel Co., Inc.

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Tensiometer

A new 8-p. two-color bulletin describing a continuous tension indicator for cold-rolled strip in steel, brass, and aluminum mills has been announced. Illustrated with photographs and diagrams, the new bulletin (GEA-5512) described the mechanical and electrical operation of the tensiometer, its possible applications, and recommended auxiliary equipment. General Electric.

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Metallic oxide cores

Behavior characteristics of metallic oxide Ceramag cores under varying conditions of permeability, flux density, temperature, and other magnetic properties are described in a new 12-p. technical bulletin. New ways of cutting costs and raising efficiency are suggested. Stackpole Carbon Co.

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Free Publications

Rubber jar batteries

The third edition of *Battery Technology Handbook*, 56-p., is available. A new section on battery charging has been added. In addition to instructions and engineering data on the care of motive-power batteries is a section on the theory of the lead-acid battery. The book is profusely illustrated and should be a valuable source of information for all who use or service batteries. *Gould-National Batteries, Inc.*

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Tool steels

A pocket handbook covering the annealing, hardening, tempering of high speed tool and die steels

has been released. The 86-p. book contains a fund of information on the properties and characteristics of tool steels, as well as many basic tables which find everyday use in the toolroom and heat treat shop. *Latrobe Electric Steel Co.*

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Tube bending

The constantly expanding use of tubing has taxed production facilities of many plants. A new 8-p. illustrated booklet described the expanded facilities and capacities of a specialist in machining operations involving bent tubing. *Tube Bends Inc.*

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Generating sets

A new 24-p. booklet describes the Struver-Deutz engines and generating sets. A range of slow and high speed engines to meet all requirements has been provided. The air-cooled diesels are dependable and give long service. The booklet is illustrated with pictures, drawings and technical information on all models. *Ad. Struver.*

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For that file job

High cutting durability and precision form are embodied in Horse Special files. These files are especially useful in precision engineering and saw sharpening work. Described in a well-indexed 24-p. catalog, the illustrations and descriptions leave no question as to the right file for your filing job. *August Ruggelberg Marienheide Rhld.*

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Flexible shaft tool

Eight different speeds ranging from 800 to 40,000 rpm are possible with a motor, gear and flexible cable arrangement described in a new brochure. The 1/4 hp, 3-phase, motor and gear provide speeds for a wide range of operations, from milling and filing of steel to high speed grinding operations. A large model built on stand, with casters is available. *Trumpf & Co.*

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Wire strainer design

A new *Engineers Manual of Wire Cloth Strainer Design* has been issued. The booklet takes the reader step-by-step through the design of special strainers. Weave, mesh, wire size and type of metal are discussed. Factors on flow rate, and notes on construction, adapters, and fabrication practices are discussed. *Michigan Wire Cloth Co.*

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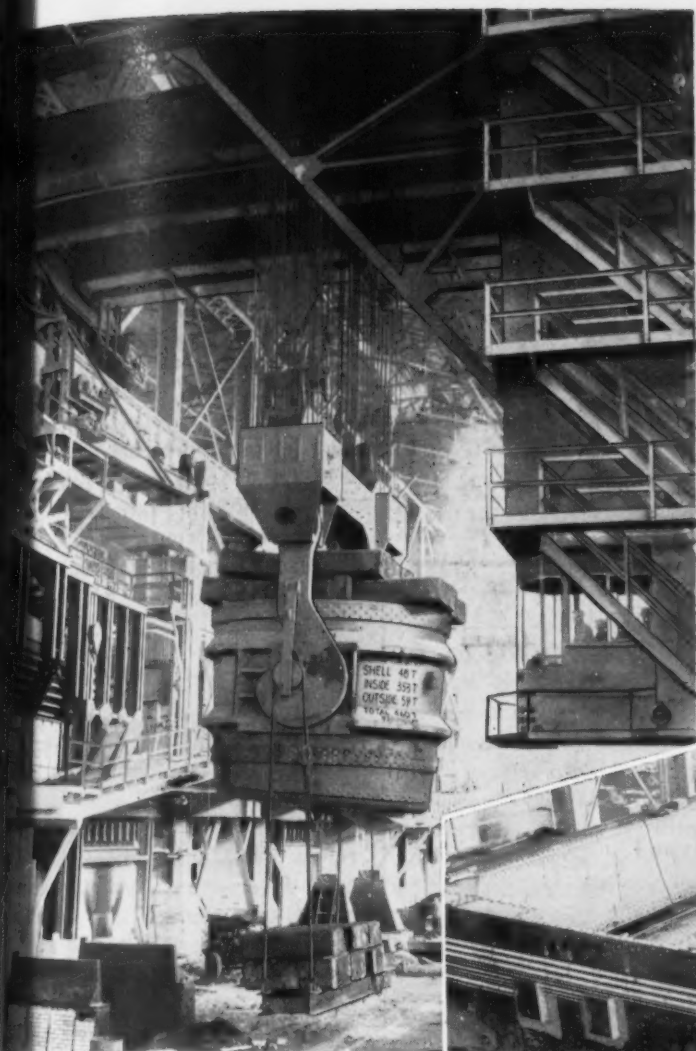
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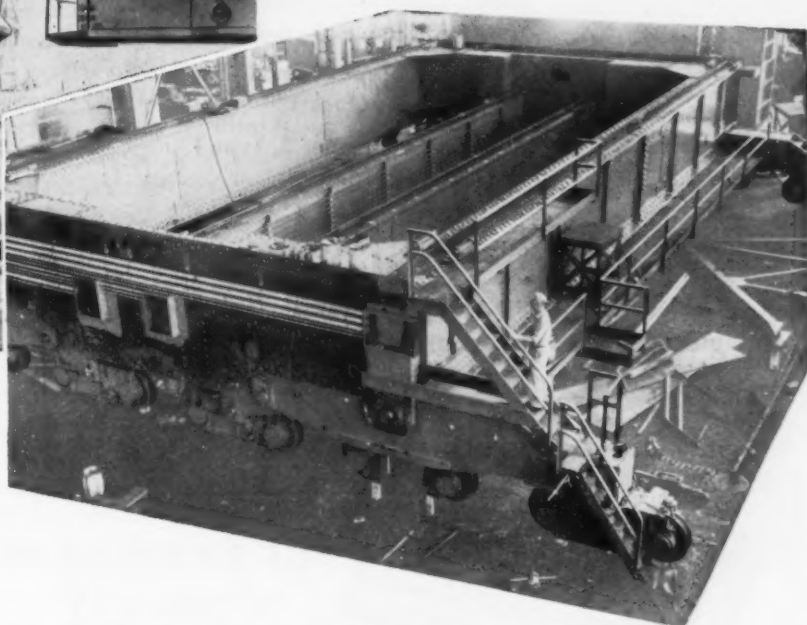
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(At right) View of 300-Ton Ladle Crane during assembly on erection floor of Morgan Engineering Co., Alliance, Ohio



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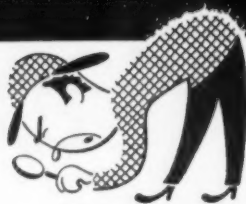
Note the width of this ladle crane. Six motors (3 on a side) are operated as 3 pairs of 2 motors in parallel to drive the bridge motion. EC&M Duplex Controllers help insure that the pairs of motors divide the load between each other. Current peaks during starting, accelerating, plugging and re-acceleration are accurately matched in each motor circuit by this EC&M Control Method.

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Free Literature

Caustic soda

Purchasing departments will find new 24-p. bulletin on the comparison of various forms of caustic soda, methods of shipping and ordering hints in selecting the chemical form most economical and evaluated. The section on equipment design has been especially prepared to deal with the problems of engineering, construction and maintenance personnel. Charts and tables showing freezing point, specific gravity at various temperatures, NaOH content and density and other properties of caustic soda are presented. *Pennsylvania Soda Mfg. Co.*

For free copy insert No. 14 on postcard, p. 17

Asbestos jointing

Compressed asbestos jointing consists principally of asbestos fibers bonded with a small amount of rubber. The combination has long been favored as a jointing material where pressure-tight joints are required. A new 24-p. booklet describes a wide range of old and new uses of this material where pressure tight gasketing is a requisite. *Richard Klinger, Ltd.*

For free copy insert No. 15 on postcard, p. 17

Stainless alternates

A 12-p. booklet, *A Guide to Type 430 Stainless Steels as Alternates of the 18-8 Series* has been released to help manufacturers affected by defense restrictions on the use of chromium-nickel stainless steel. Differences in operations arising when 430 is used as an alternate for types 302 and 304 are explained. *Republic Steel Corp.*

For free copy insert No. 16 on postcard, p. 17

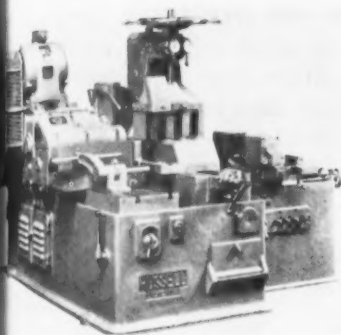
Diecasting

Modern engineering and production methods have pushed diecasting ahead as a satisfactory and inexpensive means of making difficult parts. Facilities described in a new 24-p. booklet are available to handle a wide range of part manufacture. *The New England Die Casting Co.*

For free copy insert No. 17 on postcard, p. 17

NEW equipment

New and improved production ideas, equipment, services and methods described here offer production economies . . . fill in and mail postcard on page 173 or 174.



Cold sawing machine has simple design

Simplified design and construction and centralized controls were built into the Hydrofeed high speed cold sawing machines. High production rates can be maintained with minimum exertion on the part of the operator. The automatic cycle of operations is hydraulically controlled to insure correct sequence of operations. Setup is simple.

Stock is carried between gripper jaws. At the start of the cycle the stock is gripped and moved forward the required length. The vise grips and cutting cycle starts. Grippers return and, when the saw comes to rest, the vises open. Stock is then moved forward and the cycle repeats. *S. Russell & Sons Ltd.*

For more data insert No. 18 on postcard, p. 173



Armor plate grinding easier with new machine

The Mercury Series E-20 traveling head grinder offers a new approach to the problem of face grinding. Designed for grinding of armor plate, it offers new opportunities in grinding edges, angular surfaces, compounds and bevels as well as machining pads on heavy castings 20 ft and longer. The grinder runs on self-powered precision rollers along rails machined to precision tolerances and equipped with built-in leveling devices. A 20 in. face-type grinding wheel is mounted on a head which tilts from horizontal

to full vertical. There is complete mobility with traverse rate continuously variable. Two or more grinders can operate simultaneously on a single set of rails. The rails are mounted on a concrete base and kept clean by a wiper system. The 20 hp motor and heavy duty precision spindle assembly are mounted within rigid trunnions and arranged to feed in and out through a 7 in. range. A planetary gear driven motor reducer is used. *Mercury Engineering Corp.*

For more data insert No. 19 on postcard, p. 173



Liberian mines get big diesel coolers

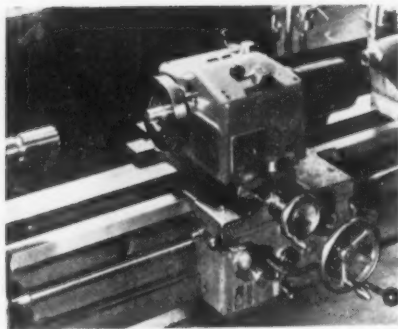
The first of four huge fluid coolers has been shipped to Monrovia, Liberia, for use in iron ore mines where they will air-cool jacket water and lube oil for big GM diesel power plants. The unit's 102 in. fan will blow 80,000 cubic feet of air per minute across six rows of extended surface heat exchanger

cores to cool 300 gal of water and 150 gal of lubricating oil per minute. Similar units have already been installed at U. S. Navy radio overseas setups, and in the giant Gulf Coast aluminum reduction plants. *Trane Co.*

For more data insert No. 20 on postcard, p. 173

Turn Page

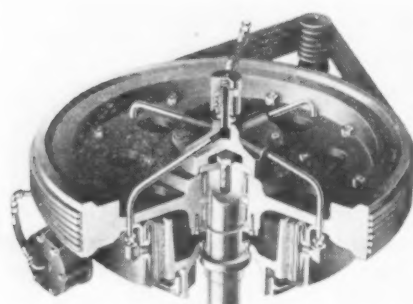
New Equipment



Production threading on lathes, mills, grinders

An integrally-powered lead attachment designed as a workholding and leading device for multiple-form cutter thread milling on lathes or milling machines, may also be used as lead for multi-rib wheel thread grinding on plain grinders. Operation is simple. The attachment is mounted on the lathe cross-slide or milling machine table; multi-form

thread-milling cutter is mounted on spindle. Short workpieces to 6 and 7 in. diam, irregular contour pieces and long work to 2½ in. diam can be threaded. Motor is reversible for cutting left and right hand, or internal and external threads. Limit switches prevent overtravel. Gube Lin International Corp. Swisma Division. For more data insert No. 21 on postcard, p. 178.

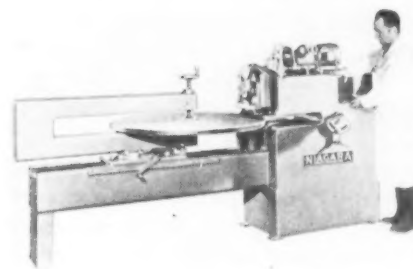


Air clutch and brake designed for presses

A new air friction clutch and spring and air-applied brake combination for use with Press-Rite power presses has been announced. Interlocking clutch-brake action, long maintenance-free life, and increased operator safety are claimed. Clutch and brake are of the constricting drum type. Interlocking

of clutch and brake action prevents either from being engaged while the other is operating. Wear is limited to shoe linings. The action and bearings are seal packed. The mechanism is simply designed and as easily removed. Sales Service Machine Tool Co.

For more data insert No. 22 on postcard, p. 178.

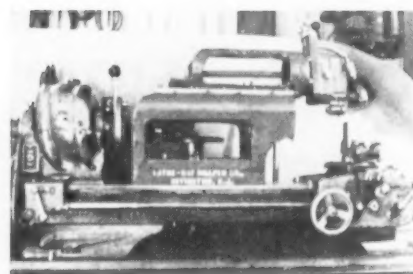


Circle shear, flanger speeds disc output

A new high speed circle shear and flanger has been designed for high production of discs and heads at a minimum tool investment. Manufacturers of tanks, drums, boilers, hot water heaters, containers and metal furniture will find this ma-

chine especially useful. Job setup can be changed for size in a few minutes, and changeover from circle cutting to flanging can be made in 20 to 30 min. It shears up to 8 gage mild steel. Niagara Machine & Tool Works.

For more data insert No. 23 on postcard, p. 178.

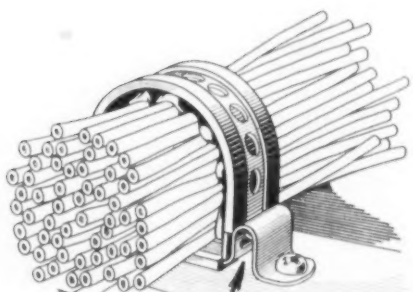


Shaper makes lathe more flexible

A novel shaper attachment for lathes gives the lathe owner additional flexibility in machining operations. The Lathe-Way shaper takes but a few moments to set up. The work piece is held in a vise mounted directly on the cross-slide allowing full use of the automatic

cross-feed. The tool head may be swivelled 360°. Vertical feed of tool is about 3 in. maximum. Stroke of cut is adjustable from 1½ in. to 4 in. Recommended depth of cut is 0.040 in. West Machinery & Supply Co., Inc.

For more data insert No. 24 on postcard, p. 178.



Clamp gives added security in wire assemblies

A new wire harness clamp gives added security for bundles of wire installed in aircraft, heavy vehicles or mobile units. The new clamp can be opened and closed without the use of tools and is built with a unique interlocking slot and tongue so it cannot be opened accidentally.

The T-shaped tongue, quickly inserted by pressure of the hand on the clamp, slips into a narrow portion of the slot and is held by lateral and outward spring action. The clamp may be used singly or in pairs. Tinnerman Products, Inc.

For more data insert No. 25 on postcard, p. 178.

Removes broken taps

A new Elox Electron Drill removes broken taps, drills, reamers and studs at record speeds. It is fast, easy and economical to operate and has proved invaluable in salvaging parts at a fraction of their cost. An electrode—a hollow copper alloy tubing available in various diameters—is chucked into the disintegrating head and held firmly by a collet. In removing a broken tap



or drill, an electrode about half the diameter of the broken tool is used. The head is lowered so the electrode is centered about 1/4 in. above the tap. As the head is fed downward, in the same manner as a drill press, a series of electric arcs cut down between the core and threads of the tap without damage to the threads. In a through hole the core can be knocked out as soon as the electrode has cut its way through. In a blind hole the core is picked out with a magnetized pick or sweepers. Elox Corp. of Michigan. For more data insert No. 26 on postcard, p. 173

Pressurized fire-gun

A 1-qt air-pressurized fire extinguisher discharges vaporizing liquid fluid for extinguishing both flammable liquid and electrical type fires. It aims and operates like a gun—with trigger-quick action. No special effort is required. American-La Franco-Foamite Corp.

For more data insert No. 27 on postcard, p. 173

Turn Page



Unusually clean sockets in double-extrusion-produced Cleveland Socket Screws

You're sure of faster-working, extra clean sockets in Cleveland Socket Head Screws. Made by the Kaufman Double Extrusion Process in closely controlled progressive operations in one machine, (see above) sockets are perfectly concentric, true hex with sharp corners, and clean—all the way to the bottom. It pays you to specify and buy Cleveland Socket Head Screws.

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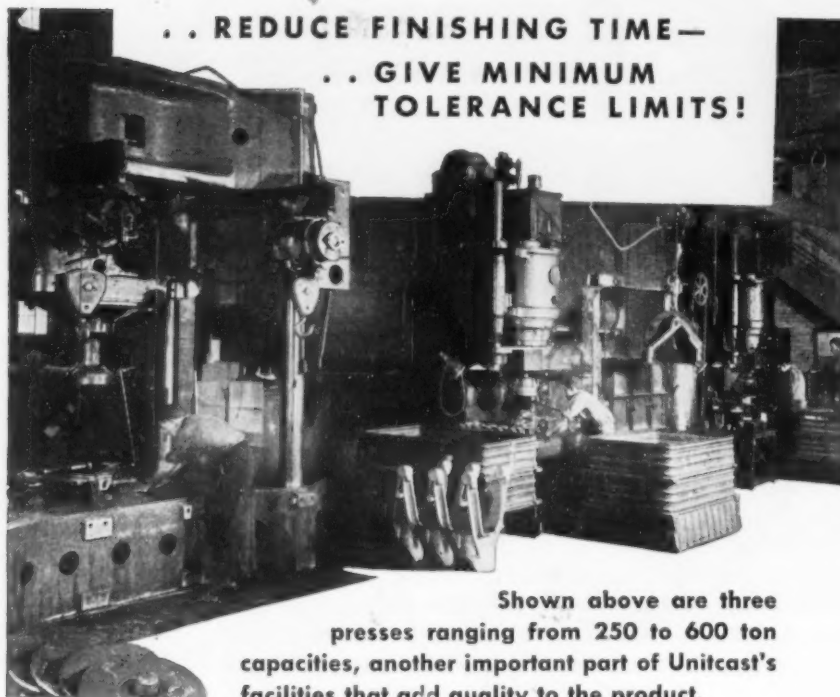
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TOLERANCE LIMITS!



Shown above are three presses ranging from 250 to 600 ton capacities, another important part of Unitcast's facilities that add quality to the product.

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- Do your castings fit machining fixtures properly, consistently?
- Are your finish allowances held to a minimum?

INTERCHANGEABILITY has long been recognized as the forerunner of mass production. Unitcast daily production is held to the specified dimensional tolerances, assuring you this very important advantage.

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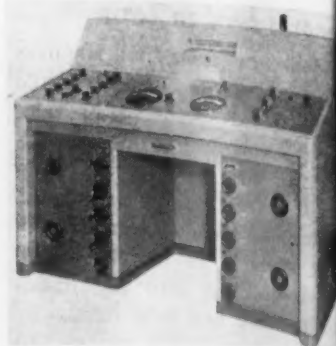
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UNITCASTINGS ARE FOUNDRY ENGINEERED

—New Equipment—



Magnetic testing desk

A new dc magnetic testing desk contains all major components for routine dc magnetization and hysteresis tests and simple flux measurements. Used in conjunction with magnetic devices, testing of nearly all types of magnetic materials is possible. Instruments are completely enclosed in aluminum. Base size is 5 ft 4 in. x 2 ft 6 in. Height is 4 ft and total weight 600 lb. General Electric.

For more data insert No. 28 on postcard, p. 171

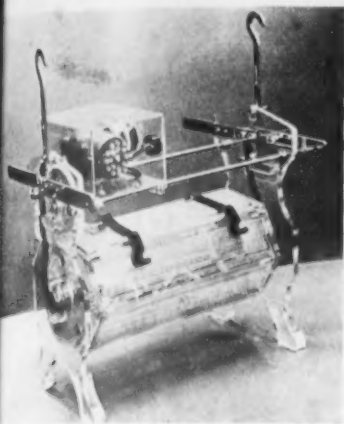
Nylon bearing

A new Nylined bearing consists of an outer sleeve of inexpensive metal and a thin lining of Nylon bearing material. The liner is retained in the outer sleeve in a manner that will permit it to expand and contract circumferentially around the inner periphery of the outer sleeve. The liner has a narrow slot, or compensation gap, which interrupts the circumference and takes up dimensional changes. In applications where lubricants can be used, one or more annular grooves are provided on the inside of the outer sleeve to form storage wells for grease or other lubricants which are evenly distributed through the compensation gap. Nylined bearings present no cold flow or creep problem; are inexpensively and rapidly installed by press fit or clamping methods. They are furnished in plain sleeve type or the flange type. Thomson Industries, Inc.

For more data insert No. 29 on postcard, p. 171

Plate small parts

The Mercil portable plating apparatus is equipped with Plexiglas cylinder 6 in. in diam x 12 in. long and 8 in. in diam by 18 in. long.



The unit is light and handles small parts efficiently at various speeds. Legs and gears are of Plexiglas. The motor is 1/15 hp and can be operated on 110 or 220 v, single phase ac. The tank can be used in either acid or alkaline solutions providing that the operating temperature of the bath does not exceed 180°F. *Hanson-Van Winkle-Manning Co.*

For more data insert No. 30 on postcard, p. 173

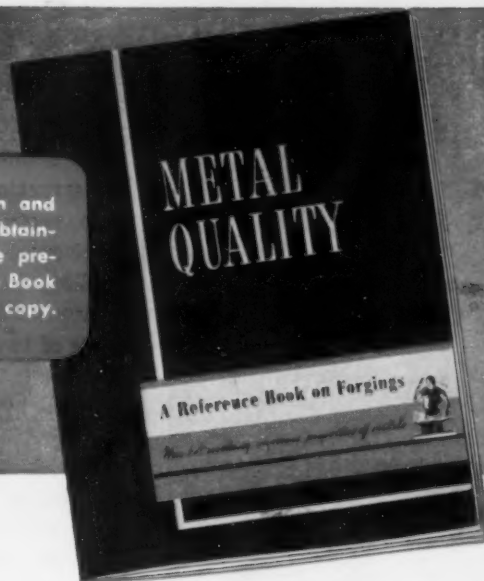
Capacitor motors

Single-phase capacitor motors in totally fan-cooled construction have been added to GE's Tri-Clad line. Features of design include starting capacitors and switch mounted within the frame to provide maximum protection with minimum space requirements. Available in ratings of 1, 1½, 2, 3 and 5 hp the new line was developed for use where extra severe conditions of dirt, grit, or moisture are encountered. It is also offered in explosion proof and dust-explosion proof construction for installation in hazardous locations. Of cast iron construction, the motors feature the standard Tri-Clad protection against physical damage, electrical breakdown, and operating wear and tear. *General Electric Co.*

For more data insert No. 31 on postcard, p. 173

Turn Page

Engineering, production and economic advantages obtainable with forgings are presented in this Reference Book on forgings. Write for a copy.



● Attempts to gain the unusual mechanical and economic advantages of closed die forgings without using forgings seldom meet with success. There is no substitute for the combination of strength and toughness inherent in the compact fiber-like flow line structure of forgings. Consult a Forging Engineer about how you can obtain a correct combination of mechanical qualities in forgings for your particular type of equipment.

DROP FORGING ASSOCIATION

605 HANNA BLDG. • CLEVELAND 15, OHIO

Please send 60-page booklet entitled "Metal Quality — How Hot Working Improves Properties of Metal", 1949 Edition.

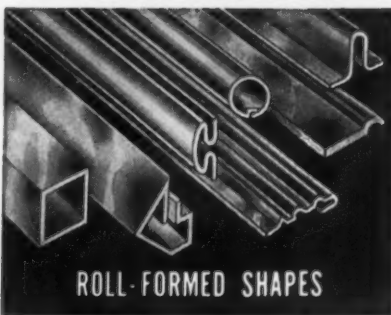
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New Equipment

Overhead conveyer

The Econ-O-Veyor employs a new construction having trolleys with two vertical wheels and a single horizontal wheel, with successive trolleys connected together by a heavy roller chain. The track consists of two T sections running side by side with a vertical trolley wheel carried by each T section and the horizontal wheel running between the sections. On turns a third T section is employed and the chain pull is distributed almost equally between the three wheels giving full rolling contact at all points and eliminating need for traction wheels or roller turns. The drive is caterpillar type of constant or variable speed. Trolleys are on 12-in. centers. *Shuler Conveyors, Inc.*

For more data insert No. 32 on postcard, p. 173

Thermocouple pyrometer

A new immersion thermocouple pyrometer for temperature of molten steel consists of a platinum—platinum 10 pct rhodium immersion couple and a Speedomax pyrometer with special signalling features. The thermocouple is mounted in a refractory-protected tube, 5 to 12 ft long. *Leeds & Northrup Co.*

For more data insert No. 33 on postcard, p. 173

Painted metal coils

Metal coils, pre-coated in color and precision slit to exact width, facilitate production and reduce manufacturing costs in a number of industries. Trademarked Enamelstrip, the coil is available in cold rolled steel, electro-galvanized steel and electrolytic tinplate, brass, zinc and aluminum in any desired color or shade, coating on one or two sides. The Enamelstrip process which binds the adhesive coating to the metal enables the coil to withstand the stresses of drawing, bending, forming and fabricating without cracking or peeling. *Enamelstrip Corp.*

For more data insert No. 34 on postcard, p. 173



**Smoother
Castings**

**Fewer
Rejects**

WITH

**ALSiMag[®]
Ceramic
STRAINER CORES**

It's good business to use ALSiMag Ceramic Strainer Cores—they save you money in several ways. Fit snugly in the gate of the mold to strain the incoming metal—give cleaner castings. Easy to handle—speed production. Easy to store—save valuable foundry space.

ALSiMag Ceramic Strainer Cores are tough, kiln-fired, flat ceramic pieces. They withstand all normal foundry pouring temperatures. Gas free. Even thermal expansion. Little abrasion from metal stream. Made in many shapes and sizes.

Free Samples of stock sizes sent on request. Samples made to your own specifications at moderate cost. Ask for **NEW PRICES**. Write today. Test them in your own foundry.

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50 YEARS OF CERAMIC LEADERSHIP
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New Equipment—

Gravity Conveyers

Three units—straight sections, 90° sections, and trestles—are able to meet all gravity roller needs with a new type conveyor design. Balanced rollers rotate on full length cold-rolled steel shafts fitted with

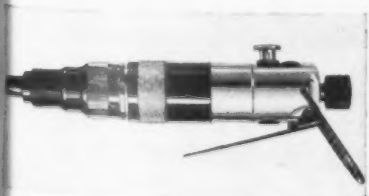


ball bearings. Shafts retain alignment and cross channels prevent the frame from spreading under heavy loads. Rollers are spaced on 4 in. centers for maximum bearing surface and are raised $\frac{3}{8}$ in. above the frame to accommodate packages wider than the conveyor. The conveyor units are able to handle a wide range of materials and are especially useful in the gravity handling of cartons, packages, boxes, crates, and pallets and similar products where hand propulsion is needed. *Lyon Metal Products, Inc.*

For more data insert No. 33 on postcard, p. 173

Air tool has rapid reverse

A new air-powered screw driver and nut setter has been designed with push-button control for instantaneous reverse action. The



operator pushes a button and the action is instantly reversed. When forward motion is again desired, pressure is released from the spring-triggered push-button. *Aro Equipment Corp.*

For more data insert No. 36 on postcard, p. 173

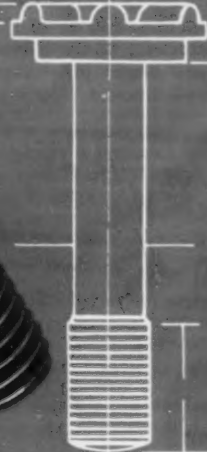
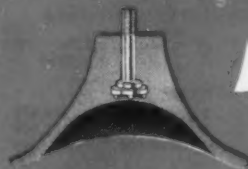


IT'S ALL 'IN THE HEAD'

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The heads of these special bolts have a built-in determination to resist rotation within the molded rubber product encasing them. This extra holding power is all in the head—precision formed on our modern cold-heading machinery. Even though never seen by the customer, this bolt serves him well doing a special job of bonding the strength of steel with the resilience of rubber.

THIS **® MASSAGE CUP BOLT** is typical of many molded-in-rubber applications in which the life of the product depends upon a special **®** Bolt



APPLICATIONS Similar applications of rubber encased bolt heads are found in cushion mounts, automotive bumpers, vacuum cups, motor mountings, shockless suspensions and in track pads.

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FOR EVERY "SPECIAL" PROBLEM



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Listed below are some of the operations discussed in Oakite's new 44-page illustrated booklet on Metal Cleaning. Please check the list. Then let us show you how Oakite materials and methods can give you better production with greater economy.

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- ☐ Steam-detergent cleaning
- ☐ Barrel cleaning
- ☐ Burnishing
- ☐ Rust prevention
- ☐ Send me a FREE copy of your booklet "Some good things to know about Metal Cleaning"

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International

Canada:

New blast furnace increases pig iron output 365,000 tons yearly.

With the blowing in of its new blast furnace, Dominion Foundries & Steel Ltd., becomes the fifth company in Canada engaged in the production of pig iron. The furnace, with coke ovens, represents an expenditure of some \$15,000,000, and will have a daily capacity of 1000 tons. However, for the present it will maintain a production schedule of only 700 tons daily.

The new furnace came at an opportune time, both for the company and for the Canadian steel industry in general. Dominion Foundries, previously operating on purchased pig iron and scrap, both in short supply, had been unable to reach capacity production for the past two months. However, with its own furnace, the company looks for an immediate return to full operations. The new blast furnace will add approximately 365,000 tons to Canada's pig iron production, bringing its annual capacity to 3,110,000 tons.

Boosts Base Metals Output

Canada's base metal production for the first half of this year shows a substantial gain over the corresponding period of 1950, according

CANADIAN STEEL IMPORTS

FROM:	Five Months	
	1951	1950
UNITED STATES:—		
Pig iron	\$ 3,959,000	\$ 139,000
Scrap iron	1,386,000	497,000
Castings	3,528,000	2,692,000
Rolling mill products	47,967,000	27,993,000
Pipe	13,776,000	27,993,000
Wire	3,296,000	2,064,000

UNITED KINGDOM:—		
Castings	\$ 1,084,000	\$ 646,000
Rolling mill products	7,361,000	2,575,000
Pipe	2,558,000	1,365,000
Wire	1,239,000	821,000

FRANCE:—		
Rolling mill products	\$ 996,000	\$ 9,000

BELGIUM:—		
Rolling mill products	\$ 5,240,000	\$ 937,000

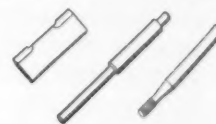
GERMANY:—		
Rolling mill products	\$ 635,000	\$ 13,000

SWEDEN:—		
Rolling mill products	\$ 212,000	\$ 75,000

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Special equipment and volume production enable us to save for you on a wide variety of precision metal parts.

For example, special shafts and pivots are made to order for meters, instruments, speedometers, tachometers, etc. Sharp, concentric, ground or swaged single or double points. Diameters .015" to 5/16". Lengths 3/16" to 10".

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TORRINGTON NEEDLE BEARINGS

International

to the Dominion Bureau of Statistics.

For the 6 months ending with June, 1951, production of nickel amounted to 66,964 tons as compared with 62,022 tons in the first half of 1950.

Output of copper in the half year amounted to 173,318 tons against 131,445 tons in the first half of 1950.

Production of lead rose to 75,731 tons from 72,295 tons a year ago.

Zinc output totalled 155,484 tons in the first half this year against 152,404 tons in the 1950 period.

Cut English Car Quota

The Ministry of Supply in England has told the domestic motor industry that in the next year it is to supply only 80,000 passenger cars to the home market. This year's quota is 100,000. The edict has gone forth because the rearmament program will call for another 500,000 workers during the next 2 years. They can't be making arms and goods for civilian use at the same time, and there will have to be a switch.

The motor industry is feeling the first impact. About 2 years will be added to the delivery date for cars already on order, which means at least a 7-year wait for motorists who want cars costing less than \$2,800. Several thousand skilled men will be switched from passenger car production to the building of trucks and tanks. Car makers are expected to keep their exports.

British Raise Scrap Prices

The British National Federation of Scrap Iron and Metal Merchants has assured the Minister of Supply that the recent increase in scrap iron and steel prices will be passed on to scrap sellers. The merchants also assured the Minister that the rise in scrap prices will secure a substantial increase in the recovery of scrap.

The Iron and Steel Corp. of Great Britain and the British Iron and Steel Federation started the increase, which amounts to \$5 per

BASIC FACTS ABOUT MODERN MATERIALS HANDLING

HOW IT WORKS — WHAT IT DOES — WHAT IT SAVES

Study of major importance to business and industry is made available by CLARK

A practical, profitable way to produce more goods with the same amount of human effort, is presented simply and graphically in a new booklet offered by the Industrial Truck Division of the Clark Equipment Company, of Battle Creek, Michigan.

This booklet points up technological advances in materials handling operations that are effecting extraordinary benefits for industry—such as faster production, increased economy and efficiency, improved human relations, lower accident and damage rates, quickened distribution and substantial cash savings. Simply and directly it describes tested and

proved means to help speed up and perfect the imperative integration of a military and a civilian economy.

2-BILLION SAVING POSSIBLE

Concretely, this study points up a quick and certain way for industry to save some \$2,000,000,000* annually at a time when the country, faced with a rearmament program of 50 billions a year for at least three years, is in desperate need of every possible mechanical aid to save time and speed production. Many advantages in other directions, not reckoned in dollars and cents, will be recognized at once by every reader.

This new CLARK study is neither fancy nor complex. It is a well-illustrated, simply-written exposition of the sound and sensible fundamentals on which modern materials handling techniques and practices are based. It describes ways and means of getting the most out of fork-lift trucks, powered hand trucks and industrial towing tractors, at the least possible cost. For the many businesses which have not yet adopted modern handling methods and machines, the booklet will be found invaluable. For the thousands of progressive businesses already employing modern methods and machines, it is just as valuable as a check against omissions, abuses and opportunities for full achievement of production goals and potentials.

SEND FOR YOUR COPY

To get a copy of "Basic Facts About Materials Handling" fill out the coupon, attach it to your business letterhead and mail it to the Clark Equipment Company, Industrial Truck Division, Battle Creek, Michigan. If you want additional copies for key personnel, they are available in reasonable quantities.

*Materials Handling Case Book, McGraw-Hill Book Co., Inc. 1951



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International

2000 lb on the chief classes of scrap. It is generally considered that the maximum prices of ferrous scrap are now fixed for some years ahead. Apart from small increases, mainly to meet additional transportation costs, delivered prices of iron and steel scrap have been kept stable since 1937.

Europe to Up Production 25 Pct

The Organization for European Economic Co-operation will aim at a 25 pct increase in Western European production in the next 5 years, according to a decision made by the organization's Ministerial Council in Paris Aug. 29.

Such an increase, which is considered well within Europe's capacity, would strengthen the general economy as well as sustain the burden of the present defense program. The production increase is seen particularly for coal, steel, electricity, and agriculture.

U.S. Firms Buy British Machines

American manufacturers have ordered more than \$9,000,000 worth of British machine tools for delivery here in the next two years. With U. S. machine makers swamped with orders and plagued by shortages, plants in need of additional machinery to fill defense orders are turning to foreign sources, which offer good delivery on almost all types. Prices of British machine tools landed here, including duty, freight and servicing are reported to compare quite favorably with American prices.

Zinc Cuts Hit British Galvanizers

Returns issued by the Zinc Development Assn. show that the British galvanizing industry has been badly hit by the Minister of Supply's zinc rationing scheme.

In the first half of this year general galvanizers received at first only half, and later 55 pct of 1950 zinc purchases. The allocation for specialist galvanizers was arranged differently, and was in some cases even less.

General galvanizing in the first two quarters of the year was at



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—International—

about 65 pct of the rate for the first half of 1950. This was only achieved by using up stocks at the works and by emptying the baths which could no longer be kept working.

Stocks of zinc at galvanizing establishments were almost halved between October 1950 and June 30 last.

Steel Controls in Great Britain

Control over the distribution of most forms of carbon steel will be introduced in Great Britain on Dec. 3. After that date no person may buy carbon steel without an "I. S. authorization" specifying quantities and purposes. Authorizations will not be needed to buy small quantities (2240 lbs a quarter or less according to the form of steel). Roughly 95 pct of steel used in Britain is carbon steel.

The present controls on sheet steel and sheet steel products remain unaltered, while no controls on alloy steel have yet been announced.

Scottish Ore Fields Reopened

The Bangrin Tin Dredging Co. and the Siamese Tin Syndicate Ltd. have jointly acquired mineral rights in lead and zinc fields in Lanarkshire and Dumfriesshire borders in Scotland. In the fields there are upwards of 60 veins in a small area, most of which were worked near the surface in the past, but only a few to any depth. It is considered that there is a reasonable chance of discovering workable ore at present day prices.

Observe Tin Can Manufacture

Specialists from the canning industries of Great Britain and France spent 6 weeks visiting American plants to take home some production know-how. As part of the tour, they visited the canmaking plants and labs of American Can Co., at Maywood, Ill.

Frank K. Artis, an executive of Crosse & Blackwell, Ltd., London, who headed the overseas group, was duly impressed by the enormous scale of mechanization of the Caneo plant.

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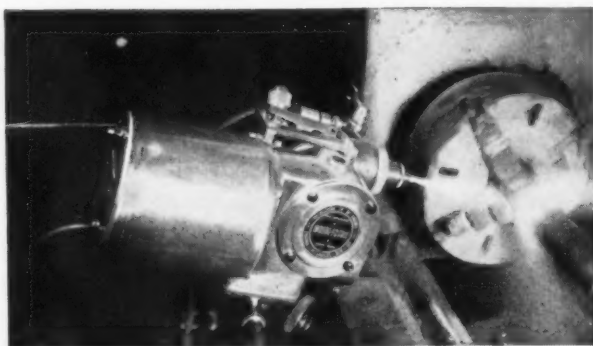
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International

Steel Up:

British Increase Prices to Meet Higher Costs of Raw Materials

As background to the recent increase in steel prices, the British Iron & Steel Federation has provided figures showing how costs have risen in the past year. Price stability, says the Federation, has long been a policy of the steel industry, and since April 1949 the main increases in cost have been borne by the industry. Improvements in efficiency helped to carry this burden. The average quantity of coal consumed per long ton of finished steel was reduced from 4233.6 lbs in 1948 to 3832.4 lbs in 1950, and labor productivity in steel melting and rolling improved from an index figure of 126.7 in 1948 to 139.3 in 1950 and to 148.8 in the first 5 months of this year.

Imports Main Reason—Some of the rising costs of imports were passed on to the manufacturers, and the industry's fund used to finance losses on imported raw materials and semi-finished steel bought at prices above the British level showed a surplus at the end of 2 years despite the widening gap between British and world prices. In the last few months, however, costs have been mounting steeply. The accumulated surplus has now been drawn upon to cover a substantial current deficit and the steel makers are faced with still further advances in home costs. The main increase in the past year has been in the cost of imported materials, due partly to the delayed effects of devaluation but more particularly to the repercussions of Korea. Though these items normally account for less than a quarter of total steel-making costs, they have about doubled in a period of 12 months. The effect on the industry's finances has thus been great.

The Government has now withdrawn its subsidy on imported steel and thrown the cost on to the industry. The Federation warns that still higher prices may have to be charged to cover losses on imported steel.

Materials Handling

Faster Service:

Fork trucks, palletization speed
stock handling in Texas store.

Better and faster service for its customers in West Texas and New Mexico has been provided by National Supply Co. through installation of modern material handling equipment at its Odessa, Tex., store.

Located in the heart of the oil-rich Permian Basin this store, in addition to its own business, distributes to all adjacent National Supply store points.

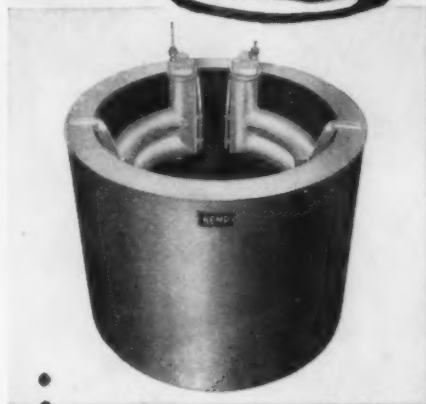
Equipment used consists of a 4000-lb. capacity industrial truck of the fork type; a supply of 42" x 48" wooden pallets; an overhead traveling crane for handling of exceptionally heavy items, and a 10-ton capacity elevator which services not only the basement and the warehouse area, but also the craneway.

Methods Used—All items that permit are palletized, then tiered directly on the floor of the 40,000-sq ft warehouse, or placed in steel racks that rise vertically some 11 ft. In addition, palletized items are stored in sections of a 90,000-sq ft yard area adjoining. The store building is of brick and concrete block in modern design. The warehouse and crane area is of steel construction, 430 ft long by 75 ft at the widest point.

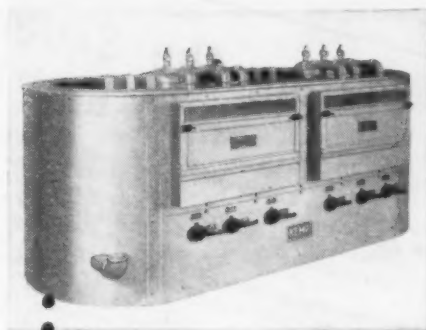
Certain features of the Odessa store, including the use of a powered fork truck and pallets, and steel storage racks in the warehouse, have been incorporated in the new modern store-office-warehouse building opened at Shreveport, La., in June 1951, replacing the former National Supply store which had been operated there since 1910.

Handling Shipments—Incoming shipments are received on highway trucks, as there is no rail siding at the store. As soon as received, they are palletized by the receiving clerk, while the fork truck operators transfer the pallets to the proper areas.

KEMP Immersion Melting Pots melt metals at Lowest Cost



- 44" pot with 10,000 lb. capacity.
- Casting rate: two tons per hour.
- Estimated fuel savings of up to 40%.



- Newspapers report actual savings of from 50% to 60% on fuel with 10-ton capacity melting pot shown above.

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If you melt soft metals, lead, pewter, tin or salt, you can now cut your melting costs to rock bottom. Actual cases prove that modern Kemp Gas-Fired Immersion Heating cuts fuel bills up to 40% and more. Reduces heat recovery time to 1/3—assures high thermal efficiency for both large and small units.

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THE HOLE STORY
 by Superior

Chapter 4

Putting the Squeeze on Tubing —to End Bends!

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In the normal course of tube drawing operations, unequal stresses are set up and the resultant tube has bends and bows which must be removed.

All these stresses are equalized in one operation. The tube is straightened and the end result is a better product for you.

To produce the world's best tubing we inspect and check many times, mechanically and metallurgically. We use microscopes to check grain structure, and keen-eyed inspectors to detect surface scratches, splits and pits. Pressure tests find any possible flaws in the walls. A continuing program keeps every Superior production worker aware of his part in the quality picture.

What does this mean to you?

It means you get fine small tubing that will do the toughest jobs better. Right now (because of Defense Orders and metal shortages) we may not be able to fill all of your tubing requirements, but it will pay you to check with your Superior distributor—he may have enough tubing in stock to help you. Always specify Superior Tubing and you'll always be right.

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 THE BIG NAME IN SMALL TUBING

All analyses .010" to 3/4" O.D.
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 Up to 1 1/4" O.D.

Low Scrap Inventories Threaten Steelmaking

Inventories barely holding their own . . . Winter stocks must be built . . . It's tough touch and go now . . . More orderly steel market seen . . . Nickel shortage causing alloy steel grief.

The record-shattering steel production pace may have to be curbed if scrap collections do not improve soon.

Right now, scrap inventories are just about holding their own. But they have to do better than that. Like many other commodities, scrap is seasonal. Collections are high in summer, low in winter. Inventories are normally accumulated during the summer, to be used during winter months when adverse weather restricts collections of scrap.

Critical Period—Such inventories aren't being accumulated. If there isn't a big improvement before cold weather, steelmakers will have to curb their production. And the long period of sustained near-capacity operations will be at an end.

The next 2 months will be critical. Steel producers and consumers, scrap people and government officials all know this. That's why they are all taking part in a gigantic effort to increase the flow of scrap to the mills.

Need Is Real—So far they haven't been too successful. It's true that steelmaking losses for lack of scrap have been negligible. But all efforts to build vital inventories have failed.

National Production Authority scrap allocations have been necessary to rescue mills faced with the prospect of shutting down furnaces. This emergency measure has helped keep vital defense production going. But it hasn't

found, collected, or moved more scrap to the mills. That is the purpose of the present nationwide scrap campaign.

Hand to Mouth—Actually, there is no assurance that steelmakers will be able to continue near capacity steelmaking operations even until cold weather. Many of them are living hand to mouth right now—operating out of freight cars.

Electric furnace steelmaking shops are having a particularly hard time. They need top-quality scrap which is most scarce. One typical large electric melt shop never was able to exceed 3 days' inventory during a recent 20-day period. This shows how narrow is the margin of safety even now.

It's no wonder steelmakers are worrying about winter. Behind them is the fact that they've already beaten hot weather, holidays, vacations and maintenance problems. Ahead is a period which will test the nerves of steel and scrap men. Winter is no friend to scrap collection.

Bum Steer—Hope that steel order cancellations would help clear up the fourth quarter logjam appears to be a forlorn one. One producer reported that so far cancellations total less than 1000 tons—not enough to open up mill space for Controlled Materials Plan tickets looking for a place to lodge.

This is putting producers in something of a spot with consumers who are being told by Washington officials to check with

mills for space created by expected cancellation of steel orders.

Better Days—Although steel supplies are expected to be just as tight during the first quarter of next year, it is expected that distribution will be a lot more orderly. By that time disrupted customer relationships will have been largely restored. And there are signs that CMP is about ready to start functioning as it was expected to in the beginning.

For one thing, figures given out by DPA and NPA on the amount of steel to be available to industry are beginning to jibe. The reduction in allotments to makers of civilian goods is not expected to mean more steel to other industries. It is believed this results from a more realistic matching of manufacturers' needs against expected production.

Who's Got Nickel?—Alloy steel producers continue to find their biggest headache is nickel. They can't get enough to accommodate tonnages allocated by NPA. This was the reason one major producer of armor plate shut down this department for almost a month.

Some customers have been asked to substitute, where possible, another grade of steel containing no nickel. They are cooperating. Another time-consuming handicap is the large number of grades being ordered. This slows deliveries because it takes a while to accumulate enough orders of the same grade to make a heat.

Steelmaking operations this week are scheduled at 100 pct of rated capacity, up 1 point from last week's revised rate.



Here is a Baldwin press which one owner found versatile enough to do many jobs at lower cost through increased production and less waste.

You too, would find dozens of jobs that it could do—and do well.

This press is engineered from experience that covers the development, design and construction of thousands of presses of all types and sizes.

It is easy and safe to operate. It provides full pressures at every point in the stroke—with full control at every stage, regardless of die size.

Why not let one of our representatives talk to you about a press—review the jobs it can do in your plant, show you how the many special Baldwin features will help to do the work better and faster, and show you evidence of proven results in other plants. Just drop us a line, or contact the nearest sales office.

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Market Briefs

appliance sales boom—Retail sales of major household appliances are expected to outstrip production by the fourth quarter of 1951. Present high inventories make it doubtful that dealers will feel the materials pinch until after the first of the year. Industry leaders believe that the return of women to defense work will bring a sharp increase in the demand for housekeeping aids. This is in addition to the high sales of complete kitchen and laundry units since World War II.

strike losses — Steel production at Republic Steel's Youngstown plant lost approximately 50,000 tons after a strike last week. Nine thousand employees went out to protest the discharge of 1 man, AWOL over a month. Republic also lost 14 miles of natural gas pipeline production last week at its Gadsden, Ala., plant. Workers demanded a noon shutdown so they could eat lunch together.

expansion program—First 3 years of the steel industry's expansion program have brought about an increase in raw steel capacity of 10.2 million tons. Annual hot rolled capacity has increased 30 pct to over 84 million tons. Electric weld and tubing increased 153 pct, from 2 million to over 5 million tons, largely because of the great demand for pipe for natural gas transmission. Total capacity for all types of pipe and tube rose 43 pct.

no slump—Business activity in the Chicago area set new records this summer, with several indices reversing their usual July downward trend. Bank loans reached an all-time high, and steel and electric power production set new July records. Planned investment expenditures in new industrial plants for the first 8 months of 1951 were above those of the same period in 1950.

new furnace — A new Pittsburgh Lectromelt furnace was placed in service at the Houston plant of Sheffield Steel Corp. last week. Having a 20-ft shell and rated capacity of 75 tons it will boost ingot capacity of the Houston mill to approximately a million tons a year. Ingot production of the new furnace which is charged with scrap will be approximately 500 tons per day.

steel orders — Some mills are booking CMP orders as far ahead as the third and fourth quarter of next year. This is true of both carbon and stainless. Much of this is believed to be for military or special government programs.

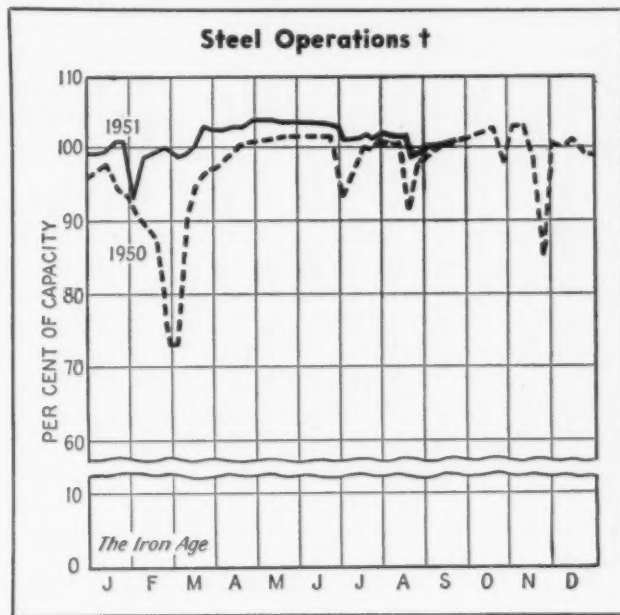
confidence — There are indications some consumers are beginning to believe CMP will straighten itself out. This is evident from steel mill reports that customers seem more willing to place their orders closer to when the steel is actually needed—rather than far ahead of output.

supply insurance—In exchange for delivery of 1 million tons of steel in the next 5 years, Chrysler and Packard have agreed to lend \$10 million to Pittsburgh Steel Co., which is financing an extensive expansion program. Chrysler will receive 800,000 tons of cold-rolled sheets and Packard 200,000 tons. The arrangement is similar to those between General Motors and Jones & Laughlin, and GM and Republic Steel.

warehouse trouble—Small manufacturers in particular will suffer from the closed-end Controlled Materials Plan, predicts Walter S. Doxey, president, American Warehouse Assn., Cleveland. Under CMP, mills will give warehouses 85 pct of tonnage delivered in the first 9 months of 1950. CMP wipes out warehouses' free market tonnage, estimated at 23 pct of shipments in the first two quarters of 1951. (THE IRON AGE, Aug. 30, 1951, p. 91).

foreign rights — U. S. businessmen are increasingly licensing the manufacturing of their products by firms in Western Europe. Many American firms, hampered in filling export orders by controls, see such deals as a profitable way to keep products and trademarks alive abroad.

freight cars — New domestic freight car deliveries totaled 7183 in August, with orders for 1828 cars received during the month. This leaves a backlog of cars on order of 139,014. Production was hampered by strikes, now settled, at two plants.



District Operating Rates—Per Cent of Capacity †

Week of	Pittsburgh	Chicago	Youngstown	Philadelphia	West	Buffalo	Cleveland	Detroit	Wheeling	South	Ohio River	St. Louis	East	Aggregate
Sept. 2.....	98.0	104.0*	102.0*	101.0	100.0	104.0	98.0	99.0*	98.0*	98.0	94.0	87.0	112.5	99.0*
Sept. 9.....	97.0	104.5	103.0	101.0	100.0	104.0	97.5	106.0	98.0	98.0	94.0	92.0	111.0	100.0

† Beginning Jan. 1, 1951, operations are based on annual capacity of 104,229,650 net tons.

* Revised.

Nonferrous Markets

Do Ceilings Choke Flow of Scrap?

Dealers report slack business, call for OPS action to improve collections . . . Ingot makers in bad shape, say job is NPA's . . . Sign 30-day tin contract—By Bob Hatschek.

Ask Price Changes—Nonferrous metal scrap dealers report almost no business at all with the exception of dealer-to-dealer transactions. Collections are still quite meager in view of low prices on metals. Collectors are putting the emphasis on waste paper, which pays them a better profit.

The trade feels that Office of Price Stabilization could help cure the present sad situation by making alterations in the ceiling price set-up. It is pointed out that, if ceilings were kept on ingot metals and removed from scrap, the ingot makers could better compete for what scrap is available and yet scrap prices would be held down by what the ingot makers could afford to pay and still make profits from their own sales.

Now Cockeyed—The large margin that exists today between scrap and ingot prices tempt ingot men to violate price laws, argue the scrap dealers as they point out how much easier it would be to control just the secondary smelters and leave out the scrap trade.

The National Assn. of Waste Material Dealers is holding a convention later this month and there is a possibility that they will call

for just such a change in the price laws. Another possibility is that they will request an increase in aluminum scrap ceilings.

NPA Job, Not OPS—Secondary metal smelters take exception to these views, stating that the job of increasing scrap flow rests with the National Production Authority rather than OPS. The ingot men could be doing a roaring business—if they had metal to sell. But most of their operations are running only partially and many of the aluminum smelters are shut down completely.

The aluminum smelters feel that their shortage of raw material can be largely attributed to the fact that much production scrap is going back to primary producers rather than into normal scrap channels which lead it to secondary furnaces.

Need Better Allocations—Ingot makers approve of dealers accumulating quantities of scrap that command premiums, saying that they, too, have to make a living and refill the scrap pipelines. But the NPA system of allocations falls apart when there just isn't enough material to fill them. Brass and bronze secondary

smelters do not anticipate any improvement for at least 30 days and the aluminum people expect to wait twice that long.

Strikers Back—As last week came to a close, the copper industry was getting back onto its feet after losing the better part of 3 weeks' production. Strikers were going back to work in dribs and drabs in compliance with the President's injunction. Labor leaders were again calling for the repeal of the Taft-Hartley Act.

It must be remembered that the strike questions have not yet been answered and that the unions involved are still holding a club over the copper companies and the defense program in their effort to get what they want.

Sign Tin Contract—The Bolivian Government has finally agreed to authorize its tin producers to sign the Reconstruction Finance Corp. contract for 30 days' tin production (about 1500 tons of concentrates). This marks the end of a 5-month abstinence by the U. S. from world markets.

The price agreed upon was \$1.12 per lb, including smelting charges, and is subject to revision. The two governments are now trying to work out some long-range agreements for the purchase of this commodity and, should any long-range contract become a reality, that price will be retroactive to June 1, 1951, and cover all tin shipped under the 30-day agreement.

Aluminum Output Zooms—The aluminum industry produced 72,698 tons of metal in July, the highest for any month since May, 1944, and 5244 tons more than in June. If this rate is maintained throughout the rest of the year, and it should be, 1951 production will total about 840,000 tons for the second highest aluminum production figure in history.

NONFERROUS METAL PRICES

	Sept. 5	Sept. 6	Sept. 7	Sept. 8	Sept. 10	Sept. 11
Copper, electro, Conn.	24.50	24.50	24.50	24.50	24.50	24.50
Copper, Lake delivered	24.625	24.625	24.625	24.625	24.625	24.625
Tins, Straits, New York	\$1.03	\$1.03	\$1.03	....	\$1.03	\$1.03
Zinc, East St. Louis	17.50	17.50	17.50	17.50	17.50	17.50
Lead, St. Louis	16.80	16.80	16.80	16.80	16.80	16.80

*Tentative

Note: Quotations are going prices.

Nonferrous Prices

MILL PRODUCTS

(Cents per lb, unless otherwise noted)

Aluminum

Sheet 30,000 lb, f.o.b. ship. pt. allowed)
Flat Sheet: 0.188 in., 2S, 3S, 30.1¢; 4S, 31.2¢; 5S, 32.4¢; 6S, 33.6¢; 7S, 34.8¢; 8S, 36.0¢; 9S, 37.2¢; 10S, 38.4¢; 11S, 39.6¢; 12S, 40.8¢; 13S, 42.0¢; 14S, 43.2¢; 15S, 44.4¢; 16S, 45.6¢; 17S, 46.8¢; 18S, 48.0¢; 19S, 49.2¢; 20S, 50.4¢; 21S, 51.6¢; 22S, 52.8¢; 23S, 54.0¢; 24S, 55.2¢; 25S, 56.4¢; 26S, 57.6¢; 27S, 58.8¢; 28S, 60.0¢; 29S, 61.2¢; 30S, 62.4¢; 31S, 63.6¢; 32S, 64.8¢; 33S, 66.0¢; 34S, 67.2¢; 35S, 68.4¢; 36S, 69.6¢; 37S, 70.8¢; 38S, 72.0¢; 39S, 73.2¢; 40S, 74.4¢; 41S, 75.6¢; 42S, 76.8¢; 43S, 78.0¢; 44S, 79.2¢; 45S, 80.4¢; 46S, 81.6¢; 47S, 82.8¢; 48S, 84.0¢; 49S, 85.2¢; 50S, 86.4¢; 51S, 87.6¢; 52S, 88.8¢; 53S, 90.0¢; 54S, 91.2¢; 55S, 92.4¢; 56S, 93.6¢; 57S, 94.8¢; 58S, 96.0¢; 59S, 97.2¢; 60S, 98.4¢; 61S, 99.6¢; 62S, 100.8¢; 63S, 102.0¢; 64S, 103.2¢; 65S, 104.4¢; 66S, 105.6¢; 67S, 106.8¢; 68S, 108.0¢; 69S, 109.2¢; 70S, 110.4¢; 71S, 111.6¢; 72S, 112.8¢; 73S, 114.0¢; 74S, 115.2¢; 75S, 116.4¢; 76S, 117.6¢; 77S, 118.8¢; 78S, 120.0¢; 79S, 121.2¢; 80S, 122.4¢; 81S, 123.6¢; 82S, 124.8¢; 83S, 126.0¢; 84S, 127.2¢; 85S, 128.4¢; 86S, 129.6¢; 87S, 130.8¢; 88S, 132.0¢; 89S, 133.2¢; 90S, 134.4¢; 91S, 135.6¢; 92S, 136.8¢; 93S, 138.0¢; 94S, 139.2¢; 95S, 140.4¢; 96S, 141.6¢; 97S, 142.8¢; 98S, 144.0¢; 99S, 145.2¢; 100S, 146.4¢; 101S, 147.6¢; 102S, 148.8¢; 103S, 150.0¢; 104S, 151.2¢; 105S, 152.4¢; 106S, 153.6¢; 107S, 154.8¢; 108S, 156.0¢; 109S, 157.2¢; 110S, 158.4¢; 111S, 159.6¢; 112S, 160.8¢; 113S, 162.0¢; 114S, 163.2¢; 115S, 164.4¢; 116S, 165.6¢; 117S, 166.8¢; 118S, 168.0¢; 119S, 169.2¢; 120S, 170.4¢; 121S, 171.6¢; 122S, 172.8¢; 123S, 174.0¢; 124S, 175.2¢; 125S, 176.4¢; 126S, 177.6¢; 127S, 178.8¢; 128S, 180.0¢; 129S, 181.2¢; 130S, 182.4¢; 131S, 183.6¢; 132S, 184.8¢; 133S, 186.0¢; 134S, 187.2¢; 135S, 188.4¢; 136S, 189.6¢; 137S, 190.8¢; 138S, 192.0¢; 139S, 193.2¢; 140S, 194.4¢; 141S, 195.6¢; 142S, 196.8¢; 143S, 198.0¢; 144S, 199.2¢; 145S, 200.4¢; 146S, 201.6¢; 147S, 202.8¢; 148S, 204.0¢; 149S, 205.2¢; 150S, 206.4¢; 151S, 207.6¢; 152S, 208.8¢; 153S, 210.0¢; 154S, 211.2¢; 155S, 212.4¢; 156S, 213.6¢; 157S, 214.8¢; 158S, 216.0¢; 159S, 217.2¢; 160S, 218.4¢; 161S, 219.6¢; 162S, 220.8¢; 163S, 222.0¢; 164S, 223.2¢; 165S, 224.4¢; 166S, 225.6¢; 167S, 226.8¢; 168S, 228.0¢; 169S, 229.2¢; 170S, 230.4¢; 171S, 231.6¢; 172S, 232.8¢; 173S, 234.0¢; 174S, 235.2¢; 175S, 236.4¢; 176S, 237.6¢; 177S, 238.8¢; 178S, 240.0¢; 179S, 241.2¢; 180S, 242.4¢; 181S, 243.6¢; 182S, 244.8¢; 183S, 246.0¢; 184S, 247.2¢; 185S, 248.4¢; 186S, 249.6¢; 187S, 250.8¢; 188S, 252.0¢; 189S, 253.2¢; 190S, 254.4¢; 191S, 255.6¢; 192S, 256.8¢; 193S, 258.0¢; 194S, 259.2¢; 195S, 260.4¢; 196S, 261.6¢; 197S, 262.8¢; 198S, 264.0¢; 199S, 265.2¢; 200S, 266.4¢; 201S, 267.6¢; 202S, 268.8¢; 203S, 270.0¢; 204S, 271.2¢; 205S, 272.4¢; 206S, 273.6¢; 207S, 274.8¢; 208S, 276.0¢; 209S, 277.2¢; 210S, 278.4¢; 211S, 279.6¢; 212S, 280.8¢; 213S, 282.0¢; 214S, 283.2¢; 215S, 284.4¢; 216S, 285.6¢; 217S, 286.8¢; 218S, 288.0¢; 219S, 289.2¢; 220S, 290.4¢; 221S, 291.6¢; 222S, 292.8¢; 223S, 294.0¢; 224S, 295.2¢; 225S, 296.4¢; 226S, 297.6¢; 227S, 298.8¢; 228S, 300.0¢; 229S, 301.2¢; 230S, 302.4¢; 231S, 303.6¢; 232S, 304.8¢; 233S, 306.0¢; 234S, 307.2¢; 235S, 308.4¢; 236S, 309.6¢; 237S, 310.8¢; 238S, 312.0¢; 239S, 313.2¢; 240S, 314.4¢; 241S, 315.6¢; 242S, 316.8¢; 243S, 318.0¢; 244S, 319.2¢; 245S, 320.4¢; 246S, 321.6¢; 247S, 322.8¢; 248S, 324.0¢; 249S, 325.2¢; 250S, 326.4¢; 251S, 327.6¢; 252S, 328.8¢; 253S, 330.0¢; 254S, 331.2¢; 255S, 332.4¢; 256S, 333.6¢; 257S, 334.8¢; 258S, 336.0¢; 259S, 337.2¢; 260S, 338.4¢; 261S, 339.6¢; 262S, 340.8¢; 263S, 342.0¢; 264S, 343.2¢; 265S, 344.4¢; 266S, 345.6¢; 267S, 346.8¢; 268S, 348.0¢; 269S, 349.2¢; 270S, 350.4¢; 271S, 351.6¢; 272S, 352.8¢; 273S, 354.0¢; 274S, 355.2¢; 275S, 356.4¢; 276S, 357.6¢; 277S, 358.8¢; 278S, 360.0¢; 279S, 361.2¢; 280S, 362.4¢; 281S, 363.6¢; 282S, 364.8¢; 283S, 366.0¢; 284S, 367.2¢; 285S, 368.4¢; 286S, 369.6¢; 287S, 370.8¢; 288S, 372.0¢; 289S, 373.2¢; 290S, 374.4¢; 291S, 375.6¢; 292S, 376.8¢; 293S, 378.0¢; 294S, 379.2¢; 295S, 380.4¢; 296S, 381.6¢; 297S, 382.8¢; 298S, 384.0¢; 299S, 385.2¢; 300S, 386.4¢; 301S, 387.6¢; 302S, 388.8¢; 303S, 390.0¢; 304S, 391.2¢; 305S, 392.4¢; 306S, 393.6¢; 307S, 394.8¢; 308S, 396.0¢; 309S, 397.2¢; 310S, 398.4¢; 311S, 399.6¢; 312S, 400.8¢; 313S, 402.0¢; 314S, 403.2¢; 315S, 404.4¢; 316S, 405.6¢; 317S, 406.8¢; 318S, 408.0¢; 319S, 409.2¢; 320S, 410.4¢; 321S, 411.6¢; 322S, 412.8¢; 323S, 414.0¢; 324S, 415.2¢; 325S, 416.4¢; 326S, 417.6¢; 327S, 418.8¢; 328S, 420.0¢; 329S, 421.2¢; 330S, 422.4¢; 331S, 423.6¢; 332S, 424.8¢; 333S, 426.0¢; 334S, 427.2¢; 335S, 428.4¢; 336S, 429.6¢; 337S, 430.8¢; 338S, 432.0¢; 339S, 433.2¢; 340S, 434.4¢; 341S, 435.6¢; 342S, 436.8¢; 343S, 438.0¢; 344S, 439.2¢; 345S, 440.4¢; 346S, 441.6¢; 347S, 442.8¢; 348S, 444.0¢; 349S, 445.2¢; 350S, 446.4¢; 351S, 447.6¢; 352S, 448.8¢; 353S, 450.0¢; 354S, 451.2¢; 355S, 452.4¢; 356S, 453.6¢; 357S, 454.8¢; 358S, 456.0¢; 359S, 457.2¢; 360S, 458.4¢; 361S, 459.6¢; 362S, 460.8¢; 363S, 462.0¢; 364S, 463.2¢; 365S, 464.4¢; 366S, 465.6¢; 367S, 466.8¢; 368S, 468.0¢; 369S, 469.2¢; 370S, 470.4¢; 371S, 471.6¢; 372S, 472.8¢; 373S, 474.0¢; 374S, 475.2¢; 375S, 476.4¢; 376S, 477.6¢; 377S, 478.8¢; 378S, 480.0¢; 379S, 481.2¢; 380S, 482.4¢; 381S, 483.6¢; 382S, 484.8¢; 383S, 486.0¢; 384S, 487.2¢; 385S, 488.4¢; 386S, 489.6¢; 387S, 490.8¢; 388S, 492.0¢; 389S, 493.2¢; 390S, 494.4¢; 391S, 495.6¢; 392S, 496.8¢; 393S, 498.0¢; 394S, 499.2¢; 395S, 500.4¢; 396S, 501.6¢; 397S, 502.8¢; 398S, 504.0¢; 399S, 505.2¢; 400S, 506.4¢; 401S, 507.6¢; 402S, 508.8¢; 403S, 510.0¢; 404S, 511.2¢; 405S, 512.4¢; 406S, 513.6¢; 407S, 514.8¢; 408S, 516.0¢; 409S, 517.2¢; 410S, 518.4¢; 411S, 519.6¢; 412S, 520.8¢; 413S, 522.0¢; 414S, 523.2¢; 415S, 524.4¢; 416S, 525.6¢; 417S, 526.8¢; 418S, 528.0¢; 419S, 529.2¢; 420S, 530.4¢; 421S, 531.6¢; 422S, 532.8¢; 423S, 534.0¢; 424S, 535.2¢; 425S, 536.4¢; 426S, 537.6¢; 427S, 538.8¢; 428S, 540.0¢; 429S, 541.2¢; 430S, 542.4¢; 431S, 543.6¢; 432S, 544.8¢; 433S, 546.0¢; 434S, 547.2¢; 435S, 548.4¢; 436S, 549.6¢; 437S, 550.8¢; 438S, 552.0¢; 439S, 553.2¢; 440S, 554.4¢; 441S, 555.6¢; 442S, 556.8¢; 443S, 558.0¢; 444S, 559.2¢; 445S, 560.4¢; 446S, 561.6¢; 447S, 562.8¢; 448S, 564.0¢; 449S, 565.2¢; 450S, 566.4¢; 451S, 567.6¢; 452S, 568.8¢; 453S, 570.0¢; 454S, 571.2¢; 455S, 572.4¢; 456S, 573.6¢; 457S, 574.8¢; 458S, 576.0¢; 459S, 577.2¢; 460S, 578.4¢; 461S, 579.6¢; 462S, 580.8¢; 463S, 582.0¢; 464S, 583.2¢; 465S, 584.4¢; 466S, 585.6¢; 467S, 586.8¢; 468S, 588.0¢; 469S, 589.2¢; 470S, 590.4¢; 471S, 591.6¢; 472S, 592.8¢; 473S, 594.0¢; 474S, 595.2¢; 475S, 596.4¢; 476S, 597.6¢; 477S, 598.8¢; 478S, 600.0¢; 479S, 601.2¢; 480S, 602.4¢; 481S, 603.6¢; 482S, 604.8¢; 483S, 606.0¢; 484S, 607.2¢; 485S, 608.4¢; 486S, 609.6¢; 487S, 610.8¢; 488S, 612.0¢; 489S, 613.2¢; 490S, 614.4¢; 491S, 615.6¢; 492S, 616.8¢; 493S, 618.0¢; 494S, 619.2¢; 495S, 620.4¢; 496S, 621.6¢; 497S, 622.8¢; 498S, 624.0¢; 499S, 625.2¢; 500S, 626.4¢; 501S, 627.6¢; 502S, 628.8¢; 503S, 630.0¢; 504S, 631.2¢; 505S, 632.4¢; 506S, 633.6¢; 507S, 634.8¢; 508S, 636.0¢; 509S, 637.2¢; 510S, 638.4¢; 511S, 639.6¢; 512S, 640.8¢; 513S, 642.0¢; 514S, 643.2¢; 515S, 644.4¢; 516S, 645.6¢; 517S, 646.8¢; 518S, 648.0¢; 519S, 649.2¢; 520S, 650.4¢; 521S, 651.6¢; 522S, 652.8¢; 523S, 654.0¢; 524S, 655.2¢; 525S, 656.4¢; 526S, 657.6¢; 527S, 658.8¢; 528S, 660.0¢; 529S, 661.2¢; 530S, 662.4¢; 531S, 663.6¢; 532S, 664.8¢; 533S, 666.0¢; 534S, 667.2¢; 535S, 668.4¢; 536S, 669.6¢; 537S, 670.8¢; 538S, 672.0¢; 539S, 673.2¢; 540S, 674.4¢; 541S, 675.6¢; 542S, 676.8¢; 543S, 678.0¢; 544S, 679.2¢; 545S, 680.4¢; 546S, 681.6¢; 547S, 682.8¢; 548S, 684.0¢; 549S, 685.2¢; 550S, 686.4¢; 551S, 687.6¢; 552S, 688.8¢; 553S, 690.0¢; 554S, 691.2¢; 555S, 692.4¢; 556S, 693.6¢; 557S, 694.8¢; 558S, 696.0¢; 559S, 697.2¢; 560S, 698.4¢; 561S, 699.6¢; 562S, 700.8¢; 563S, 702.0¢; 564S, 703.2¢; 565S, 704.4¢; 566S, 705.6¢; 567S, 706.8¢; 568S, 708.0¢; 569S, 709.2¢; 570S, 710.4¢; 571S, 711.6¢; 572S, 712.8¢; 573S, 714.0¢; 574S, 715.2¢; 575S, 716.4¢; 576S, 717.6¢; 577S, 718.8¢; 578S, 720.0¢; 579S, 721.2¢; 580S, 722.4¢; 581S, 723.6¢; 582S, 724.8¢; 583S, 726.0¢; 584S, 727.2¢; 585S, 728.4¢; 586S, 729.6¢; 587S, 730.8¢; 588S, 732.0¢; 589S, 733.2¢; 590S, 734.4¢; 591S, 735.6¢; 592S, 736.8¢; 593S, 738.0¢; 594S, 739.2¢; 595S, 740.4¢; 596S, 741.6¢; 597S, 742.8¢; 598S, 744.0¢; 599S, 745.2¢; 600S, 746.4¢; 601S, 747.6¢; 602S, 748.8¢; 603S, 750.0¢; 604S, 751.2¢; 605S, 752.4¢; 606S, 753.6¢; 607S, 754.8¢; 608S, 756.0¢; 609S, 757.2¢; 610S, 758.4¢; 611S, 759.6¢; 612S, 760.8¢; 613S, 762.0¢; 614S, 763.2¢; 615S, 764.4¢; 616S, 765.6¢; 617S, 766.8¢; 618S, 768.0¢; 619S, 769.2¢; 620S, 770.4¢; 621S, 771.6¢; 622S, 772.8¢; 623S, 774.0¢; 624S, 775.2¢; 625S, 776.4¢; 626S, 777.6¢; 627S, 778.8¢; 628S, 780.0¢; 629S, 781.2¢; 630S, 782.4¢; 631S, 783.6¢; 632S, 784.8¢; 633S, 786.0¢; 634S, 787.2¢; 635S, 788.4¢; 636S, 789.6¢; 637S, 790.8¢; 638S, 792.0¢; 639S, 793.2¢; 640S, 794.4¢; 641S, 795.6¢; 642S, 796.8¢; 643S, 798.0¢; 644S, 799.2¢; 645S, 800.4¢; 646S, 801.6¢; 647S, 802.8¢; 648S, 804.0¢; 649S, 805.2¢; 650S, 806.4¢; 651S, 807.6¢; 652S, 808.8¢; 653S, 810.0¢; 654S, 811.2¢; 655S, 812.4¢; 656S, 813.6¢; 657S, 814.8¢; 658S, 816.0¢; 659S, 817.2¢; 660S, 818.4¢; 661S, 819.6¢; 662S, 820.8¢; 663S, 822.0¢; 664S, 823.2¢; 665S, 824.4¢; 666S, 825.6¢; 667S, 826.8¢; 668S, 828.0¢; 669S, 829.2¢; 670S, 830.4¢; 671S, 831.6¢; 672S, 832.8¢; 673S, 834.0¢; 674S, 835.2¢; 675S, 836.4¢; 676S, 837.6¢; 677S, 838.8¢; 678S, 840.0¢; 679S, 841.2¢; 680S, 842.4¢; 681S, 843.6¢; 682S, 844.8¢; 683S, 846.0¢; 684S, 847.2¢; 685S, 848.4¢; 686S, 849.6¢; 687S, 850.8¢; 688S, 852.0¢; 689S, 853.2¢; 690S, 854.4¢; 691S, 855.6¢; 692S, 856.8¢; 693S, 858.0¢; 694S, 859.2¢; 695S, 860.4¢; 696S, 861.6¢; 697S, 862.8¢; 698S, 864.0¢; 699S, 865.2¢; 700S, 866.4¢; 701S, 867.6¢; 702S, 868.8¢; 703S, 870.0¢; 704S, 871.2¢; 705S, 872.4¢; 706S, 873.6¢; 707S, 874.8¢; 708S, 876.0¢; 709S, 877.2¢; 710S, 878.4¢; 711S, 879.6¢; 712S, 880.8¢; 713S, 882.0¢; 714S, 883.2¢; 715S, 884.4¢; 716S, 885.6¢; 717S, 886.8¢; 718S, 888.0¢; 719S, 889.2¢; 720S, 890.4¢; 721S, 891.6¢; 722S, 892.8¢; 723S, 894.0¢; 724S, 895.2¢; 725S, 896.4¢; 726S, 897.6¢; 727S, 898.8¢; 728S, 900.0¢; 729S, 901.2¢; 730S, 902.4¢; 731S, 903.6¢; 732S, 904.8¢; 733S, 906.0¢; 734S, 907.2¢; 735S, 908.4¢; 736S, 909.6¢; 737S, 910.8¢; 738S, 912.0¢; 739S, 913.2¢; 740S, 914.4¢; 741S, 915.6¢; 742S, 916.8¢; 743S, 918.0¢; 744S, 919.2¢; 745S, 920.4¢; 746S, 921.6¢; 747S, 922.8¢; 748S, 924.0¢; 749S, 925.2¢; 750S, 926.4¢; 751S, 927.6¢; 752S, 928.8¢; 753S, 930.0¢; 754S, 931.2¢; 755S, 932.4¢; 756S, 933.6¢; 757S, 934.8¢; 758S, 936.0¢; 759S, 937.2¢; 760S, 938.4¢; 761S, 939.6¢; 762S, 940.8¢; 763S, 942.0¢; 764S, 943.2¢; 765S, 944.4¢; 766S, 945.6¢; 767S, 946.8¢; 768S, 948.0¢; 769S, 949.2¢; 770S, 950.4¢; 771S, 951.6¢; 772S, 952.8¢; 773S, 954.0¢; 774S, 955.2¢; 775S, 956.4¢; 776S, 957.6¢; 777S, 958.8¢; 778S, 960.0¢; 779S, 961.2¢; 780S, 962.4¢; 781S, 963.6¢; 782S, 964.8¢; 783S, 966.0¢; 784S, 967.2¢; 785S, 968.4¢; 786S, 969.6¢; 787S, 970.8¢; 788S, 972.0¢; 789S, 973.2¢; 790S, 974.4¢; 791S, 975.6¢; 792S, 976.8¢; 793S, 978.0¢; 794S, 979.2¢; 795S, 980.4¢; 796S, 981.6¢; 797S, 982.8¢; 798S, 984.0¢; 799S, 985.2¢; 800S, 986.4¢; 801S, 987.6¢; 802S, 988.8¢; 803S, 990.0¢; 804S, 991.2¢; 805S, 992.4¢; 806S, 993.6¢; 807S, 994.8¢; 808S, 996.0¢; 809S, 997.2¢; 810S, 998.4¢; 811S, 999.6¢; 812S, 1000.8¢; 813S, 1002.0¢; 814S, 1003.2¢; 815S, 1004.4¢; 816S, 1005.6¢; 817S, 1006.8¢; 818S, 1008.0¢; 819S, 1009.2¢; 820S, 1010.4¢; 821S, 1011.6¢; 822S, 1012.8¢; 823S, 1014.0¢; 824S, 1015.2¢; 825S, 1016.4¢; 826S, 1017.6¢; 827S, 1018.8¢; 828S, 1020.0¢; 829S, 1021.2¢; 830S, 1022.4¢; 831S, 1023.6¢; 832S, 1024.8¢; 833S, 1026.0¢; 834S, 1027.2¢; 835S, 1028.4¢; 836S, 1029.6¢; 837S, 1030.8¢; 838S, 1032.0¢; 839S, 1033.2¢; 840S, 1034.4¢; 841S, 1035.6¢; 842S, 1036.8¢; 843S, 1038.0¢; 844S, 1039.2¢; 845S, 1040.4¢; 846S, 1041.6¢; 847S, 1042.8¢; 848S, 1044.0¢; 849S, 1045.2¢; 850S, 1046.4¢; 851S, 1047.6¢; 852S, 1048.8¢; 853S, 1050.0¢; 854S, 1051.2¢; 855S, 1052.4¢; 856S, 1053.6¢; 857S, 1054.8¢; 858S, 1056.0¢; 859S, 1057.2¢; 860S, 1058.4¢; 861S, 1059.6¢; 862S, 1060.8¢; 863S, 1062.0¢; 864S, 1063.2¢; 865S, 1064.4¢; 866S, 1065.6¢; 867S, 1066.8¢; 868S, 1068.0¢; 869S, 1069.2¢; 870S, 1070.4¢; 871S, 1071.6¢; 872S, 1072.8¢; 873S, 1074.0¢; 874S, 1075.2¢; 875S, 1076.4¢; 876S, 1077.6¢; 877S, 107

Salvage Ship Wrecks from the Sea

Maritime Administration says it knows of 125 ships sunk in shallow waters . . . To open bids on three vessels . . . Scrap collections slow . . . Pessimism on future of top melt rate.

Iron and steel scrap from World War II ship wrecks will be reclaimed to help steelmaking in this new war effort. The Maritime Administration says it knows of 125 scuttled ships which lie in relatively shallow waters and stand a good chance of being raised.

The Administration has started this reclamation campaign by asking bids on the salvaging of two tankers and a cargo ship torpedoed or sunk in offshore waters.

Policy of the agency is clearer now. It has politely rebuffed tries of steel industry scrap seekers to have torches turned on mothballed freighters. The agency played it cautious to avoid a possible row with Congress on the wisdom of scrapping ships that may have to be rebuilt later—but it will put all its weight behind helping out with ship salvage.

Bids on raising the *Halsey*, a tanker torpedoed in 1942 off the Florida East Coast, will be opened in Washington on Sept. 18. Hauling naphtha and heating oil when it went down, the ship lies in 48 ft of water.

On Sept. 19, bids will be opened for salvaging the *Crown City*, a cargo ship that ran aground off Nome, Alaska, in 1942, and is partly awash. The second tanker, the *Benjamin Brewster*, sunk in 1942, lies off the Louisiana coast in 48 ft of water. Bids on this one will open Sept. 27.

The shortage of scrap is getting so serious that more and more effort will be put on wrecking operations. The mistake made in World War II where outrageous prices were paid for such scrap will not be repeated. While allowances will be made for recovery, when the price looks too high for the overall operation the project will probably be dropped.

The slow hot weather pace of scrap flow continues into fall. This symptom is leading to heavy pessimism over the future of top capacity steelmaking this winter. Season for traditional scrap stockpile buildup is almost past while inventory remains at critical levels. The market in detail follows:

PITTSBURGH—The best that can be said about scrap supply here is that it has not improved. That is to say, it hasn't worsened—a negative sort of comfort. Some consumers have missed out on allocations because NPA figures in their pit scrap in determining inventory. The way to an allocation seems to be a dangerously low inventory. Producers are hoping this winter will be an open one; otherwise they feel production will hit the skids.

CHICAGO—Dealer inventories in the district remain at extremely low levels with some firms once again being forced to cut shifts. Scrap generated by the television industry and other consumer durable goods manufacturers in the area is reported to have dropped off 18 to 20 pct due to lack of new steel and cuts in production. The situation is expected to brighten in early October when finished goods inventories will have been reduced to permit increased production and more defense work is started. One group in the area is considering going after a huge tonnage of dormant scrap that has been in the ground over 20 years.

PHILADELPHIA—The scrap market in this district is moping along about the same as it has been. Cast is still in good supply while steel supplies remain tight. The trade reports free scrap is almost nonexistent with the majority of supplies either going directly back to the mills from industrial sources or on government allocation to this mill and that one. No new allocations have been made but dealers are still cleaning up old ones, including the "super" variety of a few weeks ago.

NEW YORK—Flow of scrap continues at the summer's slow pace and competition is keen for what good material is available. After its hot weather restup, cast grades are beginning to signal strength and some dealers feel demand can be expected to sharpen. When defense orders move into foundries in greater volume, demand will become fierce. The trade here is still working on allocations to the Youngstown area.

DETROIT—A greater negative factor in the fourth quarter scrap picture is the

coming sharper cutback in automotive production. This means less production scrap from this area. The partial vacuum will continue here until defense production begins to replace the civilian goods cutbacks.

CLEVELAND—Scrap traffic continues with little or no improvement. Despite production curtailments in some foundries, demand for cast remains constant due to increase in demands from other foundries receiving defense orders. The Cleveland Transit System now is clearing out all old and obsolete machinery and equipment from its carbarns. This will go into the scrap flow as soon as OPS establishes ceilings on the basis that such material has never been sold by CTS before. Scrap Mobilization Day met with huge ceremonial success. Now waiting for results scrapwise.

ST. LOUIS—Cast iron grades of scrap are weak in this district. Most of the foundries have light bookings and are not buying scrap at any price. Material that is needed is bought locally in small quantities and not much buying is expected until after Oct. 1. Railroad offerings are light. Melting grades movement continues slow.

BIRMINGHAM—Although the usual after-Labor Day influx of scrap metals has failed to materialize thus far, steel mills in this area are in fair condition. But they are not able to do any stockpiling. Many allocations from this area went to Southern Ohio mills, leaving the Southeast short. Supplies of electric furnace grades of scrap are becoming scarce and a pick-up in buying of cast indicates this, too, may be in short supply soon.

CINCINNATI—Anticipated increase in activities after labor day has not come. Scrap traffic in western Ohio is showing signs of slowing up, if anything. Borings and turnings still are shipped out of the area while all openhearth grades are allocated locally and to International Detrola at Newport, Ky. Good cast grades are still in demand and dealers claim an adequate supply temporarily. There is hope that agricultural scrap will begin to flow shortly. Dealers don't know how they will supply mills this winter.

BOSTON—Though the latest interpretation of rules says that shippers of steel scrap may not use waterways in establishing their shipping point ceiling prices, if it has been the customary well established practice to make shipments by rail, there is still some confusion here. Most dealers however admit that it looks as if the water rates are out. Otherwise, activity is good and all forms of scrap and cast are moving unusually well.

BUFFALO—Mills here have been able to maintain peak steelmaking operations with the scrap supply available. Although the situation is not as desperate as it was some months before, inventories have not been fattened for the lean winter months of scrap collection. Reliance on the allocations system is expected to grow more acute.

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Columbus, O. Chicago St. Louis New York

September 13, 1951

Scrap Prices

Iron and Steel

SCRAP PRICES

(Maximum basing point prices, per gross ton, set by OPS, effective Feb. 7, 1951. Shipping point and delivered prices calculated as shown below.)

		Switching Charge (Dollars per gross ton) →															
		Basing Points →															
		Pittsburgh	Johnstown	Brackenridge	Butler	Midland	Monaca	Sharon	Youngstown	Canlon	Steubenville	Warren	Wellton	Cleveland	Cuyahoga	Cincinnati	Midtown
		Chicago	Claymont	Coatesville	Conahocken	Harrisburg	Phoenixville	Sparrows Pt.	Bethlehem	Ashland, Ky.	Kokomo, Ind.	Portsmouth, O.	St. Louis	Detroit	Duluth	Kansas City	Birmingham
		Atlanta	Minneapolis	Houston	Los Angeles	Portland, Ore.	San Francisco	Seattle									
GRADES	OPS No.																
No. 1 heavy melting	1	\$44.00	\$44.00	\$43.00	\$42.50	\$42.00	\$41.00	\$41.15	\$40.00	\$39.50	\$39.00	\$38.00	\$37.00	\$36.00	\$35.00	\$34.00	\$33.00
No. 2 heavy melting	2	42.00	42.00	41.00	40.50	40.00	39.00	39.15	38.00	37.50	37.00	36.00	35.00	34.00	33.00	32.00	31.00
No. 1 busheling	3	44.00	44.00	43.00	42.50	42.00	41.00	41.15	40.00	39.50	39.00	38.00	37.00	36.00	35.00	34.00	33.00
No. 1 bundles	4	44.00	44.00	43.00	42.50	42.00	41.00	41.15	40.00	39.50	39.00	38.00	37.00	36.00	35.00	34.00	33.00
No. 2 bundles	5	41.00	41.00	40.00	39.50	39.00	38.00	38.15	37.00	36.50	36.00	35.00	34.00	33.00	32.00	31.00	30.00
Machine shop turnings	6	34.00	34.00	33.00	32.50	32.00	31.00	31.15	30.00	29.50	29.00	28.00	27.00	26.00	25.00	24.00	23.00
Mixed borings and turnings	7	38.00	38.00	37.00	36.50	36.00	35.00	35.15	34.00	33.50	33.00	32.00	31.00	30.00	29.00	28.00	27.00
Shovelling turnings	8	38.00	38.00	37.00	36.50	36.00	35.00	35.15	34.00	33.50	33.00	32.00	31.00	30.00	29.00	28.00	27.00
Cast iron borings	10	38.00	38.00	37.00	36.50	36.00	35.00	35.15	34.00	33.50	33.00	32.00	31.00	30.00	29.00	28.00	27.00
No. 1 chemical borings	26	41.00	41.00	40.00	39.50	39.00	38.00	38.15	37.00	36.50	36.00	35.00	34.00	33.00	32.00	31.00	30.00
Forge crops	11	51.50	51.50	50.50	50.00	49.50	48.50	48.65	47.50	47.00	46.50	45.50	44.50	43.50	42.50	41.50	40.50
Bar crops and plate	12	49.00	49.00	48.00	47.50	47.00	46.00	46.15	45.00	44.50	44.00	43.00	42.00	41.00	40.00	39.00	38.00
Punchings and plate	14	46.50	46.50	45.50	45.00	44.50	43.50	43.65	42.50	42.00	41.50	40.50	39.50	38.50	37.50	36.50	35.50
Electric furnace bundles	15	46.00	46.00	45.00	44.50	44.00	43.00	43.15	42.00	41.50	41.00	40.00	39.00	38.00	37.00	36.00	35.00
Cut struct., plate, 3 ft and less	16	47.00	47.00	46.00	45.50	45.00	44.00	44.15	43.00	42.50	42.00	41.00	40.00	39.00	38.00	37.00	36.00
Cut struct., plate, 2 ft and less	17	49.00	49.00	48.00	47.50	47.00	46.00	46.15	45.00	44.50	44.00	43.00	42.00	41.00	40.00	39.00	38.00
Cut struct., plate, 1 ft and less	18	50.00	50.00	49.00	48.50	48.00	47.00	47.15	46.00	45.50	45.00	44.00	43.00	42.00	41.00	40.00	39.00
Foundry steel, 2 ft and less	20	46.00	46.00	45.00	44.50	44.00	43.00	43.15	42.00	41.50	41.00	40.00	39.00	38.00	37.00	36.00	35.00
Foundry steel, 1 ft and less	21	48.00	48.00	47.00	46.50	46.00	45.00	45.15	44.00	43.50	43.00	42.00	41.00	40.00	39.00	38.00	37.00
Heavy trimmings	24	43.00	43.00	42.00	41.50	41.00	40.00	40.15	39.00	38.50	38.00	37.00	36.00	35.00	34.00	33.00	32.00
No. 1 RR heavy melting	RR 1	46.00	46.00	45.00	44.50	44.00	43.00	43.15	42.00	41.50	41.00	40.00	39.00	38.00	37.00	36.00	35.00
Scrap rails, random lengths	RR 14	48.00	48.00	47.00	46.50	46.00	45.00	45.15	44.00	43.50	43.00	42.00	41.00	40.00	39.00	38.00	37.00
Scrap rails, 3 ft and less	RR 16	51.00	51.00	50.00	49.50	49.00	48.00	48.15	47.00	46.50	46.00	45.00	44.00	43.00	42.00	41.00	40.00
Scrap rails, 2 ft and less	RR 17	52.00	52.00	51.00	50.50	50.00	49.00	49.15	48.00	47.50	47.00	46.00	45.00	44.00	43.00	42.00	41.00
Scrap rails, 18 in. and less	RR 18	54.00	54.00	53.00	52.50	52.00	51.00	51.15	50.00	49.50	49.00	48.00	47.00	46.00	45.00	44.00	43.00
Re-rolling rails	RR 15	53.00	53.00	52.00	51.50	51.00	50.00	50.15	49.00	48.50	48.00	47.00	46.00	45.00	44.00	43.00	42.00
Uncut tires	RR 20	48.00	48.00	47.00	46.50	46.00	45.00	45.15	44.00	43.50	43.00	42.00	41.00	40.00	39.00	38.00	37.00
Cut tires	RR 21	51.00	51.00	50.00	49.50	49.00	48.00	48.15	47.00	46.50	46.00	45.00	44.00	43.00	42.00	41.00	40.00
Cut bolsters and side frames	RR 23	49.00	49.00	48.00	47.50	47.00	46.00	46.15	45.00	44.50	44.00	43.00	42.00	41.00	40.00	39.00	38.00
RR specialties	RR 24, 26, 29	51.00	51.00	50.00	49.50	49.00	48.00	48.15	47.00	46.50	46.00	45.00	44.00	43.00	42.00	41.00	40.00
Solid steel axles	RR 25	58.00	58.00	57.00	56.50	56.00	55.00	55.15	54.00	53.50	53.00	52.00	51.00	50.00	49.00	48.00	47.00
No. 3 steel wheels	RR 27	51.00	51.00	50.00	49.50	49.00	48.00	48.15	47.00	46.50	46.00	45.00	44.00	43.00	42.00	41.00	40.00

Cast Scrap

(F.o.b. all shipping points)

Grades	OPS No.	
Cupola cast	1	\$49.00
Charging box cast	2	47.00
Heavy breakable cast	3	45.00
Cast iron brake shoes	5	41.00
Stove plate	6	46.00
Clean auto cast	7	52.00
Unstripped motor blocks	8	43.00
Cast iron car wheels	9	47.00
Malleable	10	55.00
Drop broken mach'y. cast	11	52.00

Ceiling price of clean cast iron foundry runouts or prepared cupola drops is 75 pct of corresponding grade.

SWITCHING DISTRICTS—These basing points include the indicated switching districts: Pittsburgh; Bessemer, Homestead, Duquesne, Munhall, Cincinnati; Newport, St. Louis; Granite City, East St. Louis, Madison, and Federal, Ill. San Francisco; South San Francisco, Niles, Oakland, Claymont; Chester, Chicago; Gary.

SHIPPING POINT PRICES (Except RR scrap)—For shipping points within basing points, the ceiling shipping point price is the basing point price, less switching charge. The ceiling for shipping points outside basing points is the basing point price yielding the highest shipping point price, less the lowest established freight charge. Dock charge, where applicable, is \$1.25 per gross ton except: Memphis, 95¢; Great Lakes ports, \$1.50, and New England ports, \$1.75. Maximum shipping point price on No. 1 heavy melting steel in New York City is \$36.99 per gross ton with set differentials for other grades. Hudson and Bergen County, N. J., shipping point prices are computed from Bethlehem basing point. All New Jersey computations use all-rail transport. Ceiling need not fall below \$32 per gross ton for No. 1 heavy melting steel, with set differentials for other grades. Cast scrap shipping point prices are given in table.

DELIVERED PRICES (RR scrap)—Ceiling on-line price of a RR operating in a basing point is the top in the highest priced basing

point in which the RR operates. For off-line prices, RR's not operating in basing point, non-operating RR's, and RR scrap sold by someone other than a RR see text of order, THE IRON AGE, Feb. 8, 1951, p. 137-C.

DELIVERED PRICES (Except RR scrap)—Ceiling is the shipping point price plus actual freight charge, tax included. Dock charges, where applicable, are as above.

UNPREPARED SCRAP—Ceiling price is \$8 a ton less than prepared base grades (No. 1 heavy & No. 1 RR heavy). Scrap suitable for compressing into No. 1 bundles is \$6 less than No. 1 bundles; suitable for compressing into No. 2 bundles, \$8 less than No. 2 bundles. For cast material requiring special preparation, price is breakable cast less preparation costs. **COMMISSIONS**—Brokers are permitted a maximum of \$1 per gross ton commission which must be separate on the bill.

ALLOY PREMIUMS—These alloy extras are permitted: Nickel; \$1.25 may be added to price of No. 1 heavy for each 0.25 pct nickel between 1 and 5.25 pct. Molybdenum; \$2 may be added to price of No. 1 heavy for molybdenum over 0.15 pct, \$3 for content over 0.65 pct. Manganese; \$4 may be added to price of No. 1 heavy or No. 1 RR heavy for content over 10 pct if scrap is in sizes over 8 x 12 x 24 in., \$14 if less than 8 x 12 x 24 in. Manganese premium applicable only if sold for electric furnace use or on NPA allocation. Silicon; electric furnace and foundry grade adjustments are not applicable if silicon content is between 0.5 and 1.75 pct. Chromium; \$1 may be added if scrap conforms to SAE 52100 analysis. **Multiple Alloys**; if scrap contains two premium alloy elements, total premium may not exceed ceiling premium for any one contained alloy.

RESTRICTIONS ON USE—Ceiling prices on some scrap items may fluctuate with use by consumers. If some scrap is purchased for its established specialized use, the ceiling price set in the order stands. But if some special grades are purchased for other uses, the ceiling price charge shall be the price of the scrap grade being substituted. For example, the price established for Grade 28 (wrought iron) may be charged only when sold to a producer of wrought iron. Otherwise the ceiling price shall not exceed the ceiling price for the corresponding grade of basic openhearth. Re-

strictions on use are placed on the following grades: Chemical borings, wrought iron and re-rolling rails, cupola cast, billet, bloom, and forge crops, Nos. 1 and 2 chemical borings. Ceiling prices on billet bloom and forge crops, alloy-free turnings, and heavy turnings may be charged only when shipped directly from industrial producer. NPA prohibits openhearth users from buying electric furnace grades. Nos. 11 through 18, foundry grades, Nos. 20 and 21 and cast grades, 1, 7, 9 and 11.

CEILING INTRANSIT PREPARATION CHARGES (Dollars per gross ton)

No. 1 heavy; No. 2 heavy; No. 1 RR heavy; No. 2 RR heavy; No. 1 busheling; No. 2 bundles; electric furnace bundles	3.00
No. 1 bundles; briquetted turnings or cast iron borings; No. 1 RR sheet scrap	6.00
Crushing machine shop turnings	2.00
Bar crops and plate, cast steel, punchings and plate, cut structural and plate, 3 ft and under, foundry steel, 2 ft and under, wrought iron	10.00
Structural, plate scrap, 2 ft and less, foundry steel 1 ft and less	11.00
Structural and plate scrap, 1 ft and less	12.00
Rails, 3 ft & less; cut tires, cut bolsters & side frames	4.00
Rails, 2 ft & less	5.00
Rails, 18 in. & less	7.00

Hamilton, Ontario

(Consumers buying prices, del'd gross ton)

Hvy. melting steel	\$35.00
No. 1 bundles	35.00
No. 2 bundles	34.50
Mechanical bundles	33.50
Mixed, steel scrap	31.00
Rails, remelting	35.00
Rails, re-rolling	29.50
Bushelings	33.00
Bushelings, prepared new factory	28.00
Bushelings, unprepared new factory	28.00
Short steel turnings	28.00
Mixed borings, turnings	28.00
Cast scrap	58.00 to 60.00

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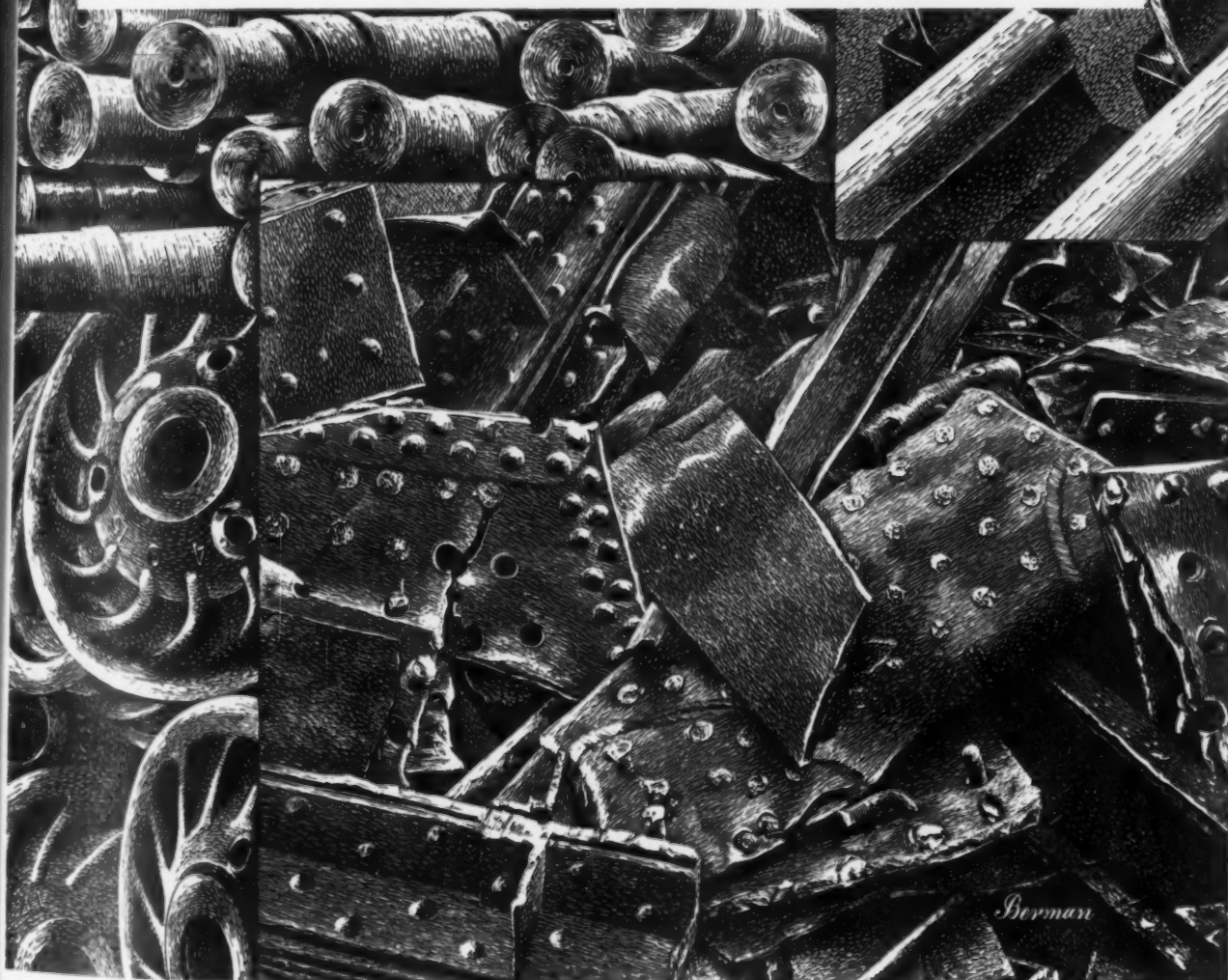


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 BOSTON, MASS. CLEVELAND, OHIO LEBANON, PENNA. PUEBLO, COLORADO
 Statler Building 1022 Midland Bldg. Luria Building 334 Colorado Bldg.
 BUFFALO, N. Y. DETROIT, MICHIGAN NEW YORK, N. Y. READING, PENNA.
 Genesee Building 2011 Book Building 100 Park Avenue Luria Building

ST. LOUIS, MISSOURI
 2052 Railway Exchange Bldg.

SAN FRANCISCO, CALIFORNIA
 Pacific Gas & Elec. Co., Bldg.

LEADERS IN IRON AND STEEL SCRAP SINCE 1889



Comparison of Prices

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Flat-Rolled Steel:	Sept. 11, 1951	Sept. 4, 1951	Aug. 14, 1951	Sept. 12, 1950
(cents per pound)	1951	1951	1951	1950
Hot-rolled sheets	3.60	3.60	3.60	3.35
Cold-rolled sheets	4.35	4.35	4.35	4.10
Galvanized sheets (10 ga)	4.80	4.80	4.80	4.40
Hot-rolled strip	3.50	3.50	3.50	3.25
Cold-rolled strip	4.75	4.75	4.75	4.21
Plate	3.70	3.70	3.70	3.50
Plates wrought iron	7.85	7.85	7.85	7.85
Stains C-R strip (No. 302)	36.75	36.75	36.75	34.50

Tin and Ternplate:

(dollars per base box)				
Tinplate (1.50 lb.) cokes	\$8.70	\$8.70	\$8.70	\$7.50
Tinplate, electro (0.50 lb.)	7.40	7.40	7.40	6.60
Special coated mfg. ternes	7.50	7.50	7.50	6.35

Bars and Shapes:

(cents per pound)				
Merchant bars	3.70	3.70	3.70	3.45
Cold finished bars	4.55	4.55	4.55	4.145
Alloy bars	4.30	4.30	4.30	3.95
Structural shapes	3.65	3.65	3.65	3.40
Stainless bars (No.302)	31.50	31.50	31.50	30.00
Wrought iron bars	9.50	9.50	9.50	9.50

Wire:

(cents per pound)				
Bright wire	4.85	4.85	4.85	4.50

Rails:

(dollars per 100 lb)				
Heavy rails	\$3.60	\$3.60	\$3.60	\$3.40
Light rails	4.00	4.00	4.00	3.75

Semifinished Steel:

(dollars per net ton)				
Re-rolling billets	\$56.00	\$56.00	\$56.00	\$54.00
Slabs, re-rolling	56.00	56.00	56.00	54.00
Forging billets	66.00	66.00	66.00	63.00
Alloy blooms billets, slabs	70.00	70.00	70.00	66.00

Wire Rod and Skelp:

(cents per pound)				
Wire rods	4.10	4.10	4.10	3.85
Skelp	3.35	3.35	3.35	3.15

Price advances over previous week are printed in Heavy Type; declines appear in *Italics*.

Pig Iron:

	Sept. 11, 1951	Sept. 4, 1951	Aug. 14, 1951	Sept. 12, 1950
(per gross ton)	1951	1951	1951	1950
No. 2 foundry, del'd Phila.	\$57.77	\$57.77	\$57.77	\$51.76
No. 2, Valley furnace	52.50	52.50	52.50	46.50
No. 2, Southern Cin'ti	55.58	55.58	55.58	49.08
No. 2, Birmingham	48.88	48.88	48.88	42.38
No. 2, foundry, Chicago†	52.50	52.50	52.50	46.50
Basic del'd Philadelphia	56.92	56.92	56.92	50.92
Basic, Valley furnace	52.00	52.00	52.00	46.00
Malleable, Chicago†	52.50	52.50	52.50	46.50
Malleable, Valley	52.50	52.50	52.50	46.50
Charcoal, Chicago	70.56	70.56	70.56	68.56
Ferromanganese†	186.25	186.25	186.25	173.40

†The switching charge for delivery to foundries in the Chicago district is \$1 per ton.

‡Average of U. S. prices quoted on Ferroalloy page.

Scrap:

(per gross ton)				
No. 1 steel, Pittsburgh	\$44.00*	\$44.00*	\$44.00*	\$43.75
No. 1 steel, Phila. area	42.50*	42.50*	42.50*	38.50
No. 1 steel, Chicago	42.50*	42.50*	42.50*	40.00
No. 1 bundles, Detroit	41.15*	41.15*	41.15*	37.50
Low phos. Young'n	46.50*	46.50*	46.50*	46.25
No. 1 cast, Pittsburgh	49.00†	49.00†	49.00†	51.75
No. 1 cast, Philadelphia	49.00†	49.00†	49.00†	44.50
No. 1 cast, Chicago	49.00†	49.00†	49.00†	50.50

*Basing Pt. †Shipping Pt.

Not including broker's fee after Feb. 7, 1951.

Coke: Connellsville:

(per net ton at oven)				
Furnace coke, prompt	\$14.75	\$14.75	\$14.75	\$14.25
Foundry coke, prompt	17.75	17.75	17.75	16.25

Nonferrous Metals:

(cents per pound to large buyers)				
Copper, electro, Conn.	24.50	24.50	24.50	23.80
Copper, Lake, Conn.	24.625	24.625	24.625	24.00
Tin, Straits, New York	\$1.03†	\$1.03	\$1.03	\$1.025
Zinc, East St. Louis	17.50	17.50	17.50	17.50*
Lead, St. Louis	16.80	16.80	16.80	15.80*
Aluminum, virgin	19.00	19.00	19.00	17.50
Nickel, electrolytic	59.58	59.58	59.58	51.22
Magnesium, ingot	24.50	24.50	24.50	22.50
Antimony, Laredo, Tex.	42.00	42.00	42.00	32.00

†Tentative. *Revised.

Composite Prices

Finished Steel Base Price

Sept. 11, 1951	4.131¢ per lb.
One week ago	4.131¢ per lb.
One month ago	4.131¢ per lb.
One year ago	3.837¢ per lb.

	High	Low
1951....	4.131¢ Jan. 2	4.131¢ Jan. 2
1950....	4.131¢ Dec. 1	3.837¢ Jan. 3
1949....	3.837¢ Dec. 27	3.3705¢ May 3
1948....	3.721¢ July 27	3.193¢ Jan. 1
1947....	3.193¢ July 29	2.848¢ Jan. 1
1946....	2.848¢ Dec. 31	2.464¢ Jan. 1
1945....	2.464¢ May 29	2.396¢ Jan. 1
1944....	2.396¢	2.396¢
1943....	2.396¢	2.396¢
1942....	2.396¢	2.396¢
1941....	2.396¢	2.396¢
1940....	2.30467¢ Jan. 2	2.24107¢ Apr. 16
1939....	2.35367¢ Jan. 3	2.26689¢ May 16
1938....	2.58414¢ Jan. 4	2.27207¢ Oct. 18
1937....	2.58414¢ Mar. 9	2.32263¢ Jan. 4
1936....	2.32263¢ Dec. 28	2.05200¢ Mar. 10
1932....	1.89196¢ July 5	1.83910¢ Mar. 1
1929....	2.31773¢ May 28	2.26498¢ Oct. 29

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold-rolled sheets and strips, representing major portion of finished steel shipment. Index recapitulated in Aug. 28, 1941, issue and in May 12, 1949.

Pig Iron

.....\$52.69 per gross ton....
.... 52.69 per gross ton....
.... 52.69 per gross ton....
.... 46.61 per gross ton....

	High	Low
\$52.69 Jan. 2	\$52.69 Jan. 2	
52.69 Dec. 12	45.88 Jan. 3	
46.87 Jan. 18	45.88 Sept. 6	
46.91 Oct. 12	39.58 Jan. 6	
37.98 Dec. 30	30.14 Jan. 7	
30.14 Dec. 10	25.37 Jan. 1	
25.37 Oct. 23	23.61 Jan. 2	
\$23.61	\$23.61	
23.61	23.61	
23.61	23.61	
\$23.61 Mar. 20	\$23.45 Jan. 2	
23.45 Dec. 23	22.61 Jan. 2	
22.61 Sept. 19	20.61 Sept. 12	
23.25 June 21	19.61 July 6	
32.25 Mar. 9	20.25 Feb. 16	
19.74 Nov. 24	18.73 Aug. 11	
14.81 Jan. 5	13.56 Dec. 6	
18.71 May 14	18.21 Dec. 17	

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

Scrap Steel

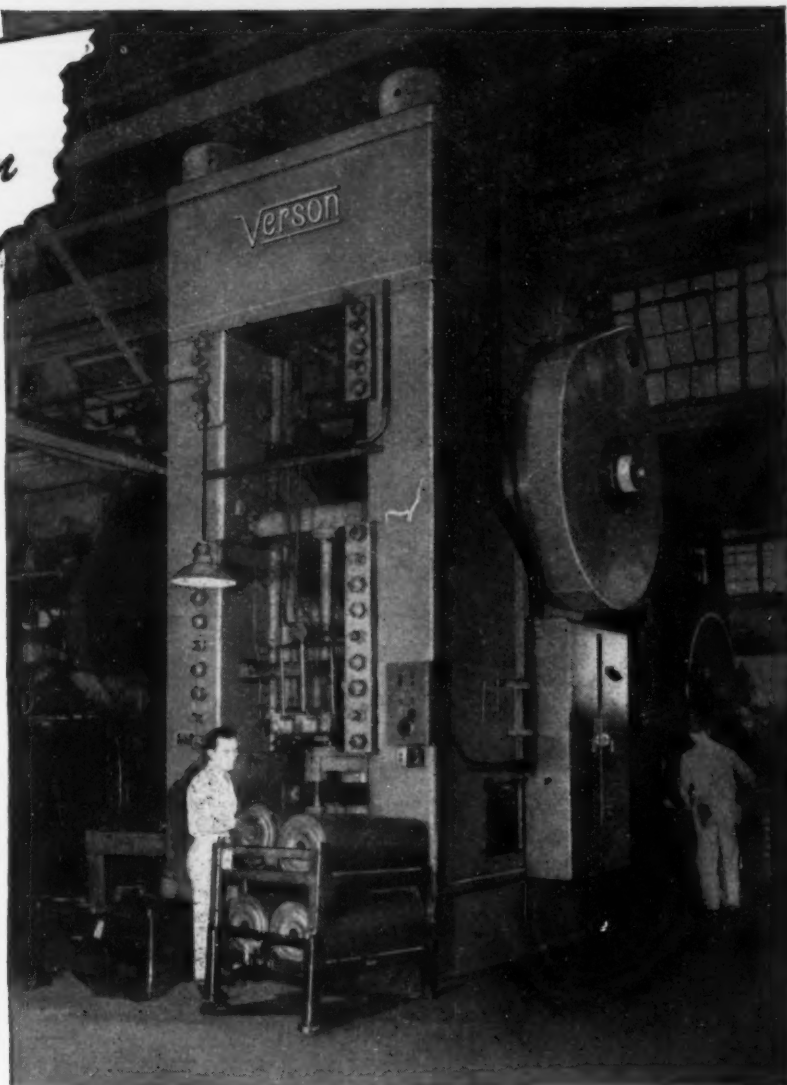
.....\$43.00 per gross ton.....
..... 43.00 per gross ton.....
..... 43.00 per gross ton.....
..... 40.75 per gross ton.....

	High	Low
\$47.75 Jan. 30	\$43.00 Feb. 7	
45.13 Dec. 19	26.25 Jan. 3	
43.00 Jan. 4	19.33 June 28	
43.16 July 27	39.75 Mar. 9	
42.58 Oct. 28	29.50 May 20	
31.17 Dec. 24	19.17 Jan. 1	
19.17 Jan. 2	18.92 May 22	
19.17 Jan. 11	15.76 Oct. 24	
\$19.17	\$19.17	
19.17	19.17	
\$22.00 Jan. 7	\$19.17 Apr. 10	
21.83 Dec. 30	16.04 Apr. 9	
22.50 Oct. 3	14.08 May 16	
15.00 Nov. 22	11.00 June 7	
21.92 Mar. 30	12.67 June 9	
17.75 Dec. 21	12.67 June 8	
8.50 Jan. 12	6.43 July 6	
17.58 Jan. 29	14.08 Dec. 8	

Average of No. 1 heavy melting steel scrap delivered to consumers at Pittsburgh, Philadelphia and Chicago.

Can you match
these production
figures?

THIS
Version
TRADE MARK
KNUCKLE JOINT
PRESS
forms
260
flywheels
per hour



In the plant of a leading automobile manufacturer, the 2000 ton Version Knuckle Joint Press illustrated stamps out automatic drive flywheels at the rate of 260 per hour. A flat blank is transformed into a flywheel ready for machining in a single operation in less than 14 seconds!

The acceptance of press forming of precision parts under tremendous force is growing rapidly. By using the knuckle joint's characteristic of applying high pressure over a con-

centrated area it is often possible to produce superior quality parts at a substantially higher rate and at a fraction of the cost of conventional methods.

Version Knuckle Joint Presses meet all requirements for work of this type. Their rugged, all steel construction in combination with Version design gives them the accuracy, power, speed and dependability so vital to this type of service. Write for complete details outlining the nature of your problem.

Originators and Pioneers of Allsteel Stamping Press Construction

VERSION ALLSTEEL PRESS COMPANY

9314 South Kenwood Avenue, Chicago 19, Illinois

So. Lamar at Ledbetter Dr., Dallas 15, Texas

A VERSION PRESS FOR EVERY JOB FROM 60 TONS UP

MECHANICAL AND HYDRAULIC PRESSES AND PRESS BRAKES • TRANSMAT PRESSES • TOOLING
DIE CUSHIONS • COMPRESSION AND TRANSFER MOLDING PRESSES

September 13, 1951

201

IRON AGE

STEEL
PRICES

Smaller numbers in price boxes indicate producing companies. For main office locations, see key on facing page.
Base prices at producing points apply only to sizes and grades produced in these areas. Prices are in cents per lb unless otherwise noted. Extras apply.

	Pittsburgh	Chicago	Gary	Cleveland	Canton Mass- illon	Middle- town	Youngs- town	Bethle- hem	Buffalo	Consho- hocken	Johns- town	Spar- rows Point	Granite City	Detroit
INGOTS														
Carbon forging, net ton	\$52.00 ¹													
Alloy, net ton	\$54.00 ¹⁻¹⁷													\$54.00 ¹
BILLETS, BLOOMS, SLABS														
Carbon, rerolling, net ton	\$56.00 ¹⁻⁸	\$56.00 ¹	\$56.00 ¹						\$56.00 ³		\$56.00 ³			
Carbon forging billets, net ton	\$66.00 ¹⁻⁵	\$66.00 ¹⁻⁴	\$66.00 ¹	\$66.00 ⁴	\$66.00 ⁴				\$66.00 ³⁻⁴	\$73.00 ³⁻⁶	\$66.00 ³			\$66.00 ¹
Alloy, net ton	\$70.00 ¹⁻¹⁷⁻⁶	\$70.00 ¹⁻⁴	\$70.00 ¹⁻⁶		\$70.00 ⁴			\$70.00 ³	\$70.00 ³⁻⁴	\$77.00 ³⁻⁶	\$70.00 ³			\$73.00 ¹
PIPE SKELP	3.35 ¹ 3.45 ²						3.35 ¹⁻⁴							
WIRE RODS	4.10 ³ 4.30 ¹⁻⁸	4.10 ³⁻⁴⁻³³	4.10 ⁶	4.10 ²			4.10 ⁶		4.10 ³⁻⁶		4.10 ³	4.20 ³		
SHEETS														
Hot-rolled (18 ga. & hvr.)	3.60 ¹⁻⁵⁻⁹⁻¹³ 3.75 ²⁻⁸	3.60 ²⁻³³	3.60 ¹⁻⁹	3.60 ⁴⁻⁵		3.80 ⁷	3.60 ¹⁻⁴⁻⁶ 4.00 ¹⁻³		3.60 ³	4.00 ²⁻⁶		3.60 ³	4.30 ²⁻³	3.80 ¹⁻³ 4.40 ¹⁻⁷
Cold-rolled	4.35 ¹⁻⁵⁻⁹⁻¹³⁻⁷		4.35 ¹⁻⁶⁻⁸	4.35 ⁴⁻⁵		4.35 ⁷	4.35 ⁴⁻⁶		4.35 ³			4.35 ³	5.05 ²⁻³	4.50 ¹⁻³
Galvanized (10 gage)	4.80 ¹⁻⁹⁻¹³		4.80 ¹⁻⁹		4.80 ⁴	4.80 ⁷	5.50 ⁴⁻⁴ 6.00 ⁴⁻⁴					4.80 ³	5.50 ²⁻³	
Enameling (12 gage)	4.65 ¹		4.65 ¹⁻⁹	4.65 ⁴		4.65 ⁷	4.65 ⁴						5.35 ²⁻³	
Long terne (10 gage)	5.20 ⁹⁻¹³		5.20 ¹			5.20 ⁷	6.00 ⁴⁻⁴							
Hi str. low alloy, h.r.	5.40 ¹⁻⁵ 5.75 ²	5.40 ¹	5.40 ¹⁻⁹ 5.90 ²	5.40 ⁴⁻⁵			5.40 ¹⁻⁴⁻¹³ 5.90 ²		5.40 ³	5.65 ²⁻⁶		5.40 ³		5.95 ¹⁻³
Hi str. low alloy, c.r.	6.55 ¹⁻⁵ 6.90 ²		6.55 ¹⁻⁹ 7.05 ²	6.55 ⁴⁻⁵			6.55 ⁴⁻⁶ 7.05 ²		6.55 ³			6.55 ³		7.10 ¹⁻³
Hi str. low alloy, galv.	7.20 ¹											6.75 ³		
STRIP														
Hot-rolled	3.60 ⁹ , 4.00 ⁴⁻¹¹ 3.75 ²⁻⁸ 3.50 ³⁻⁷	3.50 ⁴⁻⁶	3.50 ¹⁻⁵⁻⁸			3.50 ⁷	3.50 ¹⁻⁴⁻⁶ 4.00 ¹⁻³		3.50 ³⁻⁴	3.80 ²⁻⁶	3.50 ³	3.50 ³		4.40 ¹⁻⁷ 3.80 ¹⁻³
Cold-rolled	4.65 ¹⁻⁷⁻⁹ 5.00 ²⁻⁸ 5.35 ⁴⁻⁶⁻⁹⁻¹³	4.90 ²⁻⁶⁻⁶	4.90 ²	4.65 ²⁻⁶		4.65 ⁷	4.65 ⁴⁻⁶ 5.25 ⁴⁻⁶⁻⁹ 5.35 ¹⁻³⁻⁴⁻⁶		4.65 ³			4.65 ³		4.85 ¹⁻³ 5.45 ¹⁻⁷ 5.60 ⁴⁻⁶⁻¹¹
Hi str. low alloy, h.r.	5.75 ²		5.50 ¹ 5.30 ²⁻⁶ , 5.80 ⁶				4.95 ⁴⁻⁶ , 5.50 ¹ 5.40 ¹⁻³ , 5.80 ⁶ (6.20 ⁴ , 6.55 ¹⁻³) 7.05 ²		4.95 ³	5.55 ²⁻⁶		4.95 ³		5.95 ¹⁻³
Hi str. low alloy, c.r.	7.20 ²			6.55 ² 6.70 ³					6.40 ³			6.40 ³		
TINPLATE†														
Cokes, 1.25-lb base box (1.50 lb, add 25¢)	\$8.45 ¹⁻⁵⁻⁹⁻¹³		\$8.45 ¹⁻⁶⁻⁸				\$8.45 ⁴					\$8.55 ²		
Electrolytic 0.25, 0.50, 0.75 lb box	0.25 lb base box, \$7.15 ¹⁻⁴⁻⁵⁻⁸⁻⁹ ; \$7.25 ²⁻¹¹ ; \$7.35 ²⁻³ 0.50 lb, add 25¢; 0.75 lb add 65¢													
BLACKPLATE, 29 gage														
Hollowware enameling	5.85 ¹ 6.15 ¹⁻⁸		5.85 ¹				5.30 ⁴							
BARs														
Carbon steel	3.70 ¹⁻⁵ 3.85 ²	3.70 ¹⁻⁴⁻³³	3.70 ¹⁻⁴⁻⁶⁻⁸	3.70 ⁴	3.70 ⁴		3.70 ¹⁻⁴⁻⁶		3.70 ³⁻⁴		3.70 ³			3.85 ¹
Reinforcing	3.70 ¹⁻⁵	3.70 ⁴	3.70 ¹⁻⁶⁻⁸	3.70 ⁴			3.70 ¹⁻⁴⁻⁶		3.70 ³⁻⁴		3.70 ³	3.70 ³		
Cold-finished	4.55 ¹⁻⁴⁻⁵⁻¹²⁻⁶⁹⁻⁷¹	4.55 ²⁻³³⁻⁷⁰	4.55 ⁴⁻⁷⁴⁻⁷³	4.55 ²	4.55 ⁴⁻⁸⁻³		4.55 ²⁻⁶⁻⁷		4.80 ⁷⁻⁹					4.70 ⁴
Alloy, hot-rolled	4.30 ¹⁻¹⁷	4.30 ¹⁻⁴⁻³³	4.30 ¹⁻⁶⁻⁸		4.30 ⁴		4.30 ¹⁻⁶	4.30 ⁶	4.30 ³⁻⁴		4.30 ³			4.45 ¹ 4.65 ¹
Alloy, cold-drawn	5.40 ¹⁻⁷⁻⁹³⁻⁶⁹⁻⁷¹⁻²	5.40 ⁴⁻²³⁻⁶⁹⁻⁷⁰⁻⁷³ 5.45 ²	5.40 ⁴⁻⁷³⁻⁷⁴		5.40 ⁴⁻³²		5.40 ²⁻³⁻⁶⁻⁷	5.40 ³	5.40 ³					5.50 ⁴
Hi str. low alloy, h.r.	5.55 ¹⁻⁵		5.55 ¹⁻⁸ 6.05 ²	5.55 ⁴⁻⁵			5.55 ¹⁻⁵ 6.05 ²	5.55 ³	5.55 ³		5.55 ³			
PLATE														
Carbon steel	3.70 ¹⁻⁵⁻¹³ 4.00 ²	3.70 ¹⁻²³	3.70 ¹⁻⁶⁻⁸	3.70 ⁴⁻⁵			3.70 ¹⁻⁴⁻⁶ 3.95 ¹⁻³		3.70 ³	4.15 ²⁻⁶	3.70 ³	3.70 ³	4.40 ²⁻³	
Floor plates	4.75 ¹	4.75 ¹	4.75 ²	4.75 ³						4.75 ²⁻⁶				
Alloy	4.75 ¹	4.75 ¹	4.75 ¹				5.20 ¹⁻³			5.05 ²⁻⁶	4.75 ³	4.75 ³		
Hi str. low alloy	5.65 ¹⁻⁵	5.65 ¹	5.65 ¹⁻⁸ 6.15 ²	5.65 ⁴⁻⁵			5.65 ⁴ 5.70 ¹⁻³ 6.15 ²			5.90 ²⁻⁶	5.65 ³	5.65 ³		
SHAPES, Structural														
Hi str. low alloy	5.50 ¹⁻⁵	5.50 ¹	5.50 ¹⁻⁸ 6.00 ²				6.00 ⁶	5.50 ³	5.50 ³		5.50 ³			
MANUFACTURERS' WIRE														
Bright	4.85 ²⁻⁵ 5.10 ¹⁻⁸	4.85 ² 4.33-34		4.85 ²			4.85 ²	Kokomo = 4.95 ²⁻⁶ 4.85 ²⁻⁶			4.85 ²	4.95 ²	Duluth = 4.85 ²	
PILING, Steel Sheet	4.45 ¹	4.45 ¹	4.45 ²						4.45 ²					

Smaller numbers indicate producing companies. See key at right.
Prices are in cents per lb unless otherwise noted. Extras apply.

IRON AGE

STEEL PRICES

Key to Steel Producers

- 1 U. S. Steel Co., Pittsburgh
- 2 American Steel & Wire Co., Cleveland
- 3 Bethlehem Steel Co., Bethlehem
- 4 Republic Steel Corp., Cleveland
- 5 Jones & Laughlin Steel Corp., Pittsburgh
- 6 Youngstown Sheet & Tube Co., Youngstown
- 7 Armco Steel Corp., Middletown, Ohio
- 8 Inland Steel Co., Chicago
- 9 Wairton Steel Co., Wairton, W. Va.
- 10 National Tube Co., Pittsburgh
- 11 Tennessee Coal, Iron & R. R. Co., Birmingham
- 12 Great Lakes Steel Corp., Detroit
- 13 Sharon Steel Corp., Sharon, Pa.
- 14 Colorado Fuel & Iron Corp., Denver
- 15 Wheeling Steel Corp., Wheeling, W. Va.
- 16 Geneva Steel Co., Salt Lake City
- 17 Crucible Steel Co. of America, New York
- 18 Pittsburgh Steel Co., Pittsburgh
- 19 Kaiser Steel Corp., Oakland, Calif.
- 20 Portsmouth Div., Detroit Steel Corp., Detroit
- 21 Lukens Steel Co., Coatesville, Pa.
- 22 Granite City Steel Co., Granite City, Ill.
- 23 Wisconsin Steel Co., South Chicago, Ill.
- 24 Columbia Steel Co., San Francisco
- 25 Copperweld Steel Co., Glassport, Pa.
- 26 Alan Wood Steel Co., Conshohocken, Pa.
- 27 Calstrip Steel Corp., Los Angeles
- 28 Allegheny Ludlum Steel Corp., Pittsburgh
- 29 Claymont Steel Corp., Claymont, Del.
- 30 Continental Steel Corp., Kokomo, Ind.
- 31 Rotary Electric Steel Co., Detroit
- 32 Laclede Steel Co., Alton, Ill.
- 33 Northwestern Steel & Wire Co., Sterling, Ill.
- 34 Keystone Steel & Wire Co., Peoria, Ill.
- 35 Central Iron & Steel Co., Harrisburg, Pa.
- 36 Carpenter Steel Co., Reading, Pa.
- 37 Eastern Stainless Steel Corp., Baltimore
- 38 Washington Steel Corp., Washington, Pa.
- 39 Jessop Steel Co., Washington, Pa.
- 40 Blair Strip Steel Co., New Castle, Pa.
- 41 Superior Steel Corp., Carnegie, Pa.
- 42 Timken Steel & Tube Div., Canton, Ohio
- 43 Babcock & Wilcox Tube Co., Beaver Falls, Pa.
- 44 Reeves Steel & Mfg. Co., Dover, Ohio
- 45 John A. Roebling's Sons Co., Trenton, N. J.
- 46 Simonds Saw & Steel Co., Fitchburg, Mass.
- 47 McLouth Steel Corp., Detroit
- 48 Cold Metal Products Co., Youngstown
- 49 Thomas Steel Co., Warren, Ohio
- 50 Wilson Steel & Wire Co., Chicago
- 51 Sweet's Steel Co., Williamsport, Pa.
- 52 Superior Drawn Steel Co., Monaca, Pa.
- 53 Tremont Nail Co., Wareham, Mass.
- 54 Firth Sterling St. & Carbide Corp., McKeesport
- 55 Ingersoll Steel Div., Chicago
- 56 Phoenix Iron & Steel Co., Phoenixville, Pa.
- 57 Fitzsimons Steel Co., Youngstown
- 58 Stanley Works, New Britain, Conn.
- 59 Universal-Cyclops Steel Corp., Bridgeville, Pa.
- 60 American Cladmetals Co., Carnegie, Pa.
- 61 Cuyahoga Steel & Wire Co., Cleveland
- 62 Bethlehem Pacific Coast Steel Corp., San Fran.
- 63 Follansbee Steel Corp., Pittsburgh
- 64 Niles Rolling Mill Co., Niles, Ohio
- 65 Atlantic Steel Co., Atlanta
- 66 Acme Steel Co., Chicago
- 67 Joslyn Mfg. & Supply Co., Chicago
- 68 Detroit Steel Corp., Detroit
- 69 Wycoff Steel Co., Pittsburgh
- 70 Bliss & Laughlin, Inc., Harvey, Ill.
- 71 Columbia Steel & Shifting Co., Pittsburgh
- 72 Cumberland Steel Co., Cumberland, Md.
- 73 La Salle Steel Co., Chicago
- 74 Monarch Steel Co., Inc., Hammond, Ind.
- 75 Empire Steel Co., Mansfield, Ohio
- 76 Mahoning Valley Steel Co., Niles, Ohio
- 77 Oliver Iron & Steel Co., Pittsburgh
- 78 Pittsburgh Screw & Bolt Co., Pittsburgh
- 79 Standard Forging Corp., Chicago
- 80 Driver Harris Co., Harrison, N. J.
- 81 Detroit Tube & Steel Div., Detroit
- 82 Reliance Div., Eaton Mfg. Co., Massillon, Ohio
- 83 Sheffield Steel Corp., Kansas City
- 84 Plymouth Steel Co., Detroit
- 85 Wickwire Spencer Steel, Buffalo
- 86 Angell Nail and Chaplet, Cleveland
- 87 Mid-States Steel & Wire, Crawfordsville, Ind.
- 88 National Supply, Pittsburgh, Pa.
- 89 Wheatland Tube Co., Wheatland, Pa.
- 90 Mercer Tube & Mfg. Co., Sharon, Pa.
- 91 Woodward Iron Co., Woodward, Ala.
- 92 Sloss-Sheffield Steel & Iron Co., Birmingham
- 93 Hanna Furnace Corp., Detroit
- 94 Interlake Iron Corp., Cleveland
- 95 Lone Star Steel Co., Dallas
- 96 Mystic Iron Works, Everett, Mass.
- 97 Jackson Iron & Steel Co., Jackson, O.
- 98 Globe Iron Co., Jackson, O.
- 99 Pittsburgh Coke & Chemical Co., Pittsburgh
- 100 Shenango Furnace Co., Pittsburgh
- 101 Tennessee Products & Chem. Corp., Nashville
- 102 Koppers Co., Inc., Granite City, Ill.
- 103 Page Steel & Wire Div., American Chain & Cable, Monessen, Pa.
- 104 Wallingford Steel Co., Wallingford, Conn.
- 105 Tonawanda Iron Div., N. Tonawanda, N. Y.

WEST COAST
Seattle, San Francisco,
Los Angeles, Fontana

F=\$79.00¹⁹

F=\$80.00¹⁹

F=\$75.00¹⁹

F=\$85.00¹⁹
SF, LS, S=\$85.00²²

F=\$89.00¹⁹
LA=\$90.00²²

SF=4.90², F=4.90¹⁹
LA=4.90^{24, 22}

SF, LA=4.30²⁴
F=4.55¹⁹

SF=5.30²⁴
F=5.30¹⁹

SF, LA=5.55²⁴

F=6.35¹⁹

F=7.50¹⁹

SF, LA=4.25^{24, 22}
F=4.75¹⁹, S=4.50²²

F=6.30¹⁹
LA=6.40²⁷

F=6.20¹⁹
SF, LA=6.05²²
S=6.30²²

F=6.95¹⁹

SF=9.20²⁴

SF, LA=4.40²⁴

SF, S=4.45²²
F=4.40¹⁹, LA=4.40²²

LA=8.00⁴

LA=5.35²²
F=5.35¹⁹

F=6.60¹⁹ SF, S=6.30²²
LA=6.25²²

F=4.30¹⁹
S=4.60²²

F=6.25¹⁹
S=6.55²²

SF=4.20²² F=4.25¹⁹
LA=4.25^{24, 22} S=4.30²²

SF=6.10^{22, 19}
SF=6.00²² LA=6.05²²

SF, LA=5.80²⁴

Alton=4.40²²
Worcester=4.40²²
Minnequa=4.35¹⁴
Portsmouth=4.30²⁰

Niles=5.25¹⁴ Geneva=3.70¹⁶
Ashland=3.60⁷

Ashland=4.80⁷
Kokomo=5.20²⁰

Ashland=4.65⁷

Alton=4.15²²
Atlanta=4.25²²
Minnequa=4.15¹⁴

Atlanta=4.25²²
Minnequa=4.50¹⁴

Newark=6.00¹⁹
Putnam=5.10¹⁹
Hartford=5.10⁴

Newark=5.75¹⁹
Worcester=5.75²²
Hartford=5.85⁴

Claymont=4.15²⁰
Coatesville=4.15²¹
Harrisburg=6.75²²
Minnequa=4.50¹⁴
Geneva=3.70¹⁶

Harrisburg=6.75²²

Coatesville=5.25²¹
Claymont=4.85²²

Geneva=5.65¹⁶

Geneva 3.65¹⁶ Minnequa 4.10¹⁴
Phoenixville=6.25¹⁶

Geneva=5.50¹⁶
Alton=5.05²²

Atlanta=5.10²² Worcester=5.15²²
Minnequa=5.10¹⁴
Portsmouth=5.25²⁰

INGOTS
Carbon forging, net ton

Alloy, net ton

BILLETS, BLOOMS, SLABS
Carbon, reolling, net ton

Carbon forging billets, net ton

Alloy net ton

PIPE SKELP

WIRE RODS

SHEETS
Hot-rolled (18 ga. & hvr.)

Cold-rolled

Galvanized (10 gage)

Enameling (12 gage)

Long ternes (10 gage)

Hi str. low alloy, h.r.

Hi str. low alloy, c.r.

Hi str. low alloy, galv.

STRIP
Hot-rolled

Cold-rolled

Hi str. low alloy, h.r.

Hi str. low alloy, c.r.

TINPLATE
Cokes, 1.25-lb base box
(1.50 lb, add 25¢)

Electrolytic
0.25, 0.50, 0.75 lb box

BLACKPLATE, 20 gage
Hollowware enameling

BARS
Carbon steel

Reinforcing

Cold-finished

Alloy, hot-rolled

Alloy, cold-drawn

Hi str. low alloy, h.r.

PLATE
Carbon steel

Floor plates

Alloy

Hi str. low alloy

SHAPES, Structural

Si str. low alloy

MANUFACTURERS' WIRE
Bright

*Special coated mfg ternes deduct 95¢ from 1.25-lb coke base box price. Can-making quality blackplate, 65 to 128-lb, deduct \$2.20 from 1.25-lb coke base box.

Miscellaneous Prices

Base price, f.o.b., dollars per 100 lb. * (Metropolitan area delivery add 20¢ except Birmingham, San Francisco, Cincinnati, New Orleans, St. Paul, add 15¢; Memphis, add 10¢; Philadelphia, add 25¢; New York, add 30¢).

WAREHOUSES

CITY	Sheets			Strip		Plates		Shapes		Bars		Alloy Bars			
	Hot-Rolled	Cold-Rolled (16 gage)	Galvanized (10 gage)	Hot-Rolled	Cold-Rolled	Standard Structural	Standard Structural	Hot-Rolled	Cold-Finished	Hot-Rolled A 4815 As rolled	Hot-Rolled A 4140 Annealed	Cold-Drawn A 4815 As rolled	Cold-Drawn A 4140 Annealed	Cold-Drawn A 4815 As rolled	Cold-Drawn A 4140 Annealed
Baltimore	5.60	6.84	7.49 ²	6.04		5.80	6.14	6.04	8.84	10.24	10.54	11.89	12.19		
Birmingham*	5.60	6.40	6.75	5.55		5.95	5.70	5.55							
Butte	6.20	7.00	7.74	6.15	8.50 ⁴	6.48	6.20	6.05	9.79	10.25	10.55	11.90	12.20		
Butte	5.60	6.40	7.74	5.88		6.05	5.80	5.60	6.40	10.15	10.45	11.80	11.95		
Chicago	6.60	6.40	7.75	5.55		5.80	5.70	5.55	6.30	9.80	10.10	11.45	11.75		
Cincinnati*	5.87	6.44	7.39	5.80		6.19	6.09	5.80	6.61	10.15	10.45	11.80	12.10		
Cleveland	5.60	6.40	6.10	5.69	6.00	5.92	5.82	5.57	6.40	9.91	10.21	11.56	11.86		
Detroit	5.78	6.53	7.89	5.94		5.99	6.09	5.84	6.56	10.11	10.41	11.76	12.06		
Houston	7.00	8.25				6.85	6.50	6.65	9.35	10.35	11.25		12.75		
Indianapolis, del'd	6.00	6.80	8.15	5.95		6.20	6.10	5.95	6.80						
Kansas City	6.00	6.80	7.45	6.15	7.50	6.40	6.30	6.15	7.00	10.40	10.70	12.05	12.35		
Los Angeles	6.35	7.90	8.85	6.40	9.45 ⁵	6.40	6.35	6.35	8.20	11.30	11.30	13.20	13.50		
Memphis*	6.33	7.08		6.33		6.43	6.33	6.08	7.16						
Milwaukee	5.74	6.54	7.89	5.69		5.94	5.84	5.69	6.44	9.94	10.24	11.59	11.89		
New Orleans*	5.70	6.50		5.75	7.25	5.95	5.75	5.75	7.30						
New York*	6.67	7.19 ⁵	8.14 ²	6.29	8.63 ⁴	6.28	6.10	6.12	6.99	10.05	10.35	11.70	12.10		
Norfolk	5.97	7.24 ¹		6.89		6.58	6.33	6.33	7.32						
Philadelphia*	6.50 ³			6.50 ³	6.60 ³	6.50 ³	6.60 ³	6.55 ³							
Pittsburgh	5.90	6.80	8.00	6.10		6.05	5.90	6.05	6.86	9.90	10.20				
Portland	5.60	6.40	7.75	5.65		5.75	5.70	5.55	6.15	9.80	10.10	11.45	11.75		
Salt Lake City	6.80	8.95	8.50	7.30		6.80	6.95	6.90			12.15				
San Francisco*	7.55		9.10			8.05	6.75	7.95	9.00						
Seattle	7.95		10.50 ²	8.75		8.30	8.65	8.65							
St. Louis	6.85	8.05 ²	8.55	6.60	9.95 ⁶	6.50	6.45	6.45	8.20	11.30	11.30	13.20	13.50		
St. Paul	7.05	8.80	9.20	9.05		6.75	6.66	6.75	9.05						
St. Paul	5.80	6.65	8.00	5.80	8.00 ⁴	6.13	6.03	5.80	6.55	10.05	10.35	11.70	12.00		
St. Paul	5.85				8.28				6.65						
St. Paul	6.16	6.96	8.31	6.11		6.36	6.26	6.11	6.96	10.36	10.66	12.01	12.31		

BASE QUANTITIES (Standard unless otherwise keyed): Cold finished bars; 2000 lb or over. Alloy bars; 1000 to 1999 lb. All others; 2000 to 9999 lb. All HR products may be combined for quantity. All galvanized sheets may be combined for quantity. CR sheets may not be combined with each other or with galvanized sheets, for quantity. EXCEPTIONS: (1) 400 to 1499 lb; (2) 450 to 1499 lb; (3) 400 to 1999 lb; (4) 6000 lb and over; (5) 1500 to 9999 lb; (6) 2000 to 9999 lb.

PIG IRON

Dollars per gross ton, f.o.b., subject to switching charges.

Producing Point	Basic	Foundry	Malleable	Bessemer	Low Phos.	Blast Furnace Silvery	Low Phos. Charcoal
Bethlehem-3	54.00	54.50	55.00	55.50			
Birmingham-4	48.38	48.88					
Birmingham-91	48.38	48.88					
Birmingham-92	48.38	48.88					
Buffalo-4	52.00	52.50	53.00				
Buffalo-93	52.00	52.50	53.00				
Chicago-94	52.00	52.50	52.50	53.00		63.75	
Cleveland-2	52.00	52.50	52.50	53.00	57.00		
Cleveland-4	52.00	52.50	52.50				
Deingfield, Tex.-95	48.00	48.50	48.50				
Duluth-94	52.00	52.50	52.50	53.00			
Erie-94	52.00	52.50	52.50	53.00			
Everett, Mass.-96		55.25	55.75				
Fontana-19	58.00	58.50					
Geneva, Utah-16	52.00	52.50	52.50	53.00			
Granite City, Ill.-102	53.90	54.40	54.90				
Hobbs, Ohio-6	52.00	52.50	52.50				
Ironton, Utah-16	52.00	52.50					
Jackson, Ohio-97, 98						62.50	
Lyle, Tenn.-101							66.00
Monaca-18							
Neville Island-99	54.00						
Pittsburgh-1	52.00	52.50	52.50	53.00			
Sharnville-100	52.00			53.00			
Steelton-3	52.00	52.50	52.50	53.00			
Swedeland-28	54.00	54.50	55.00	55.50	60.00		
Toledo-94	56.00	56.50	57.00	57.50			
Troy, N. Y.-4	52.00	52.50	52.50	53.00			
Youngstown-9	54.00	54.50	55.00	55.50	60.00		
N. Tonawanda, N. Y.-105	52.00	52.50	52.50	53.00			

DIFFERENTIALS: Add 50¢ per ton for each 0.25 pct silicon over base (1.75 to 2.25 pct, except low phos. 1.75 to 2.00 pct), 50¢ per ton for each 0.50 pct manganese over 1 pct, \$2 per ton for 0.5 to 0.75 pct nickel, \$1 for each additional 0.25 pct nickel. Subtract 38¢ per ton for phosphorus, cement 0.70 pct and over. Silvery iron: Add \$1.50 per ton for each 0.50 pct silicon over base (0.01 to 0.50 pct) up to 17 pct. \$1 per ton for 0.75 pct or more phosphorus, manganese as above. Bessemer iron prices are \$1 over comparable silvery iron.

REFRACTORIES

Fire Clay Brick (F.o.b. works)
Carloads, Per 1000
First quality, Ill., Ky., Md., Mo., Ohio, Pa. (except Salina, Pa., add \$5).....\$94.60
No. 1 Ohio.....88.00
Sec. quality, Pa., Md., Ky., Mo., Ill. 88.00
No. 2 Ohio.....79.20
Ground fire clay, net ton, bulk (except Salina, Pa., add \$1.50).....13.75

Silica Brick
Mt. Union, Pa., Ensley, Ala.....\$94.60
Childs, Pa.99.00
Hays, Pa.100.10
Chicago District104.50
Western Utah and Calif.111.10
Super Duty, Hays, Pa., Athens, Tex., Chicago111.10
Silica cement, net ton, bulk, Eastern (except Hays, Pa.)16.50
Silica cement, net ton, bulk, Hays, Pa.18.70
Silica cement, net ton, bulk, Ensley, Ala.17.60
Silica cement, net ton, bulk, Chicago District17.60
Silica cement, net ton, bulk, Utah and Calif.24.70

Chrome Brick Per Net Ton
Standard chemically bonded, Balt., Chester\$82.00

Magnesite Brick
Standard, Baltimore\$104.00
Chemically bonded, Baltimore....93.00

Grain Magnesite St. %-in. grains
Domestic, f.o.b. Baltimore, in bulk fines removed.....\$62.70
Domestic, f.o.b. Chewelah, Wash., in bulk36.30
in sacks41.80

Dead Burned Dolomite
F.o.b. producing points in Pennsylvania, West Virginia and Ohio, per net ton, bulk Midwest, add 10¢; Missouri Valley, add 20¢.....\$13.00

COKE

Furnace, beehive (f.o.b. oven) Net Ton
Connellsville, Pa.\$14.50 to \$15.00
Foundry, beehive (f.o.b. oven)
Connellsville, Pa.\$17.50 to \$18.00
Foundry, oven coke
Buffalo, del'd\$26.69
Chicago, f.o.b.23.00
Detroit, f.o.b.24.00
New England, del'd24.80
Seaboard, N. J., f.o.b.22.75
Philadelphia, f.o.b.22.70
Swedeland, Pa., f.o.b.22.60
Painesville, Ohio, f.o.b.24.00
Erie, Pa., f.o.b.23.50
Cleveland, del'd25.72
Cincinnati, del'd25.06
St. Paul, f.o.b.22.50
St. Louis25.40
Birmingham, del'd21.69
Neville Island23.00

LAKE SUPERIOR ORES

(51.50% Fe; natural content, delivered lower lake ports) Per gross ton

Old range, bessemer.....\$8.70
Old range, nonbessemer.....8.55
Mesabi, bessemer8.45
Mesabi, nonbessemer8.30
High phosphorus8.30

After adjustments for analyses, prices will be increased or decreased as the case may be for increases or decreases after Dec. 2, 1950, in lake vessel rates, upper lake rail freights, dock handling charges and taxes thereon.

C-R SPRING STEEL

F.o.b. Mill Cents Per Lb.	CARBON CONTENT				
	0.26-0.40	0.41-0.60	0.61-0.80	0.81-1.05	1.06-1.35
Bridgeport, Conn.-56	5.35	6.80	7.40	9.35	11.65
Carnegie, Pa.-41		6.80	7.40	9.35	11.65
Cleveland-2	4.65	6.45	7.40	9.35	11.65
Detroit-68	5.60	6.65	7.25		
New Castle, Pa.-46	5.35	6.80	7.40	9.35	
New Haven, Conn.-68	5.45	6.75	7.35		
Sharon, Pa.-13	5.35	6.80	7.40	9.35	11.65
Weirton, W. Va.-9	5.35	6.80	7.40	9.35	11.65
Worcester, Mass.-2	4.95	6.75	7.70	9.65	11.65
Youngstown-48		6.80	7.40	9.35	11.65

NEW

THE ONLY PLANT IN EASTERN U. S.

EQUIPPED FOR STEEL PICKLING

COILS UP TO 48" WIDE



PICKLING coils:
1" to 48", 10 to 20 gauge
100 to 10,000 lbs.

SHEETS & PLATE: Any width,
any length, any thickness.

CAPACITY: 25,000 tons/month.

Prompt Quality Service

- ROLLER LEVELLING
- EDGE ROLLING
- COIL SHEARING
- SLITTING

MARSAM CORPORATION

Subsidiary: AMERICAN TOOL & SUPPLY CO.

OFFICE: 822 FRICK BUILDING, PITTSBURGH 22, PA. PLANT: McKEES ROCKS, PA.

In the Yard or in the Plant...

EUCLID'S "pace" the Assembly Line

Euclid Cranes prove an important link in the chain of operations required to convert incoming materials into outgoing products in a vast number of manufacturing plants.

Facility of movement through ease of precision control enables "Euclids" to handle a large variety of production operations, and to readily "pace" the assembly line. Write us concerning your crane problems. We'll be pleased to submit a proposal.



THE EUCLID CRANE & HOIST CO.

1361 CHARDON ROAD
EUCLID, OHIO

Miscellaneous Prices

BOLTS, NUTS, RIVETS, SCREWS

Consumer Prices
(Base discount, f.o.b. mill, Pittsburgh,
Cleveland, Birmingham or Chicago)

Machine and Carriage Bolts

	Pet Off List	Less Case	C.
1/2 in. & smaller x 6 in. & shorter	15	28 1/2	
9/16 in. & 5/8 in. x 6 in. & shorter	18 1/2	30 1/2	
3/4 in. & larger x 6 in. & shorter	17 1/2	29 1/2	
All diam. longer than 6 in.	14	27 1/2	
Lag, all diam. x 6 in. & shorter	23	35	
Lag, all diam. longer than 6 in.	21	33	
Plow bolts	34		

Nuts, Hot Pressed, Cold Punched—Sq

	Less Keg (Reg.)	Pet Off List Less Keg (Hvy.)	K.
1/2 in. & smaller	15	28 1/2	28 1/2
9/16 in. & 5/8 in.	12	25	6 1/2
3/4 in. to 1 1/2 in. inclusive	9	23	1
1 1/2 in. & larger	7 1/2	22	1

Nuts, Hot Pressed—Hexagon

	Less Keg	Pet Off List Less Keg	K.
1/2 in. & smaller	26	37	22
9/16 in. & 5/8 in.	16 1/2	29 1/2	6 1/2
3/4 in. to 1 1/2 in. inclusive	12	25	2
1 1/2 in. & larger	8 1/2	23	2

Nuts, Cold Punched—Hexagon

	Less Keg	Pet Off List Less Keg	K.
1/2 in. & smaller	26	37	22
9/16 in. & 5/8 in.	23	35	17 1/2
3/4 in. to 1 1/2 in. inclusive	19 1/2	31 1/2	12
1 1/2 in. & larger	12	25	6 1/2

Nuts, Semi-Finished—Hexagon

	Reg.	Hvy.
1/2 in. & smaller	35	45
9/16 in. & 5/8 in.	29 1/2	40 1/2
3/4 in. to 1 1/2 in. inclusive	24	36
1 1/2 in. & larger	13	26

Light

	Reg.	Hvy.
7/16 in. & smaller	35	45
1/2 in. thru 3/4 in.	28 1/2	39 1/2
3/4 in. to 1 1/2 in. inclusive	26	37

Stove Bolts

	Pet Off List
Packaged, steel, plain finished 48—10	31—10
Packaged, plated finish	62*
Bulk, plain finish**	

*Discounts apply to bulk shipments in not less than 15,000 pieces of a size and kind where length is 3-in. and shorter. 5000 pieces for lengths longer than 3-in. For lesser quantities, packaged price applies.

**Zinc, Parkerized, cadmium or nickel plated finishes add 6¢ per lb net. For black oil finish, add 2¢ per lb net.

Rivets

	Base per 100 lb.
1/2 in. & larger	\$7.85
7/16 in. & smaller	36
F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham, Lebanon, Pa.	

Cap and Set Screws

	Pet Off List
(In bulk)	
Hexagon head cap screws, coarse or fine thread, 1/4 in. thru 3/4 in. x 6 in., SAE 1020, bright	54
3/4 in. thru 1 in. up to & including 6 in.	48
1/4 in. thru 3/4 in. x 6 in. & shorter high C double heat treat	46
3/4 in. thru 1 in. up to & including 6 in.	41
Milled studs	36
Flat head cap screws, listed sizes	34
Fillister head cap, listed sizes	34
Set screws, sq head, cup point, 1 in. diam and smaller x 6 in. & shorter	53

S. M. Ferrochrome

	Contract price, cents per pound, chromium contained, lump size, delivered.
High carbon type: 60-65% Cr, 4-6% Si, 4-6% Mn, 4-6% C.	21.60
Carloads	22.75
Ton lots	25.25
Less ton lots	
Low carbon type: 62-66% Cr, 4-6% Si, 4-6% Mn, 1.25% max. C.	27.75
Carloads	30.05
Ton lots	31.85
Less ton lots	

Miscellaneous Prices

ELECTRODES

Cents per lb., f.o.b. plant threaded electrodes with nipples, unboxed

Diam. in in.	Length in in.	Cents Per lb.
GRAPHITE		
17, 18, 20	60, 72	17.85
8 to 16	48, 60, 72	17.85
7	48, 60	19.57
6	48, 60	20.95
4, 5	40	21.50
3	40	22.61
2 1/4	24, 30	23.15
2	24, 30	25.36
CARBON		
40	100, 110	8.03
35	65, 110	8.03
30	65, 84, 110	8.03
24	72 to 104	8.03
20	34, 90	8.03
17	60, 72	8.03
14	60, 72	8.57
10, 12	60	8.84
8	60	9.10

CLAD STEEL

Base prices, cents per pound, f.o.b. mill		
Stainless-carbon	Plate	Sheet
No. 304, 20 pct.		
Coatesville, Pa. (21)...	*29.5	
Washgtn, Pa. (39)....	*29.5	
Claymont, Del. (29)....	*28.00	
Conshohocken, Pa. (26)		*27.50
New Castle, Ind. (55)...	*26.50	*25.50
Nickel-carbon		
10 pct Coatesville (21)...	32.5	
Inconel-carbon		
10 pct Coatesville (21)...	40.5	
Monel-carbon		
10 pct Coatesville (21)...	33.5	
No. 302 Stainless-copper		
stainless, Carnegie, Pa.		77.00
(60)		
Aluminized steel sheets, hot		
dip, Butler, Pa. (7).....		7.75

*Includes annealing and pickling, or sandblasting.

TOOL STEEL

F.o.b. mill

W	Cr	V	Mo	Co	Base per lb
18	4	1	—	—	\$1.505
18	4	1	—	5	\$2.13
18	4	2	—	—	\$1.65
1.5	4	1.5	8	—	\$81.0
6	4	2	6	—	\$6.5¢
High-carbon chromium					
Oil hardened manganese					
Special carbon					
Extra carbon					
Regular carbon					
Warehouse prices on and east of Missis-					
sippi are 3.5¢ per lb higher. West of					
Mississippi, 5.5¢ higher.					

METAL POWDERS

Per pound, f.o.b. shipping point, in ton lots, for minus 100 mesh.	
Swedish sponge iron c.l.f.	
New York, ocean bags...	7.4¢ to 9.0¢
Canadian sponge iron, del'd.	
In East	10.00¢
Domestic sponge iron, 98+%	
Fe, carload lots	15.5¢ to 17.0¢
Electrolytic iron, annealed,	
99.5+% Fe	42.5¢
Electrolytic iron, unannealed,	
minus 325 mesh, 99+% Fe	53.5¢
Hydrogen reduced iron, mi-	
nus 300 mesh, 98+% Fe	63.0¢ to 80.0¢
Carbonyl iron, size 5 to 10	
micron, 98%, 99.8+% Fe	83.0¢ to \$1.48
Aluminum	31.5¢
Braas, 10 ton lots	30.00¢ to 33.25¢
Copper, electrolytic, 10.75¢ plus metal value	
Copper, reduced	10.00¢ plus metal value
Cadmium, 100-199 lb., .95¢ plus metal value	
Chromium, electrolytic, 99%	
min., and quantity, del'd.	\$3.50
Lead	7.5¢ to 12.0¢ plus metal value
Manganese	57.0¢
Molybdenum, 99%	\$2.75
Nickel, unannealed	88.0¢
Nickel, annealed	95.0¢
Nickel, spherical, unannealed	92.0¢
Silicon	38.5¢
Solder powder, .70¢ to 9.0¢ plus met value	
Stainless steel, 302	83.00¢
Stainless steel, 316	\$1.10
Tin	14.00¢ plus metal value
Tungsten, 99% (65 mesh)	\$6.00
Zinc, 10 ton lots	23.0¢ to 30.5¢

ELECTRICAL SHEETS

22 Ga. H-R cut lengths

F.o.b. Mill Cents Per Lb.	Armature	Elec.	Motor	Dynamo	Transf. 72	Transf. 65	Transf. 50
Beech-Bottom-15	7.25	8.50	9.30	9.85	10.40	11.10	
Brackenridge-28	7.25	8.50	9.30	9.85			
Follanshee-63	6.75	7.25	8.50	9.30	9.85	10.40	11.10
Granite City-22	7.95	9.20					
Inu. Harpur-3	6.75	7.25					
Mansfield-75	7.25	7.75	9.00	9.80			
Niles, O.-84	7.05	7.55					
Vandergrift-1	6.75	7.25	8.50	9.30	9.85	10.40	11.10
Warren, O.-4	6.75	7.25	8.50	9.30	9.85	10.40	11.10
Zanesville-7	6.75	7.25	8.50	9.30	9.85	10.40	11.10

Ferrochrome

Contract prices, cents per pound, contained Cr, lump size, bulk, in carloads, delivered. (65-72% Cr, 3% max. Si.)

0.06% C ...	30.50	0.20% C ...	29.50
0.10% C ...	30.00	0.50% C ...	29.25
0.15% C ...	29.75	1.00% C ...	29.00
2.00% C ...			28.75
65-69% Cr, 4-9% C			22.00
62-66% Cr, 4-6% C, 6-9% Si			22.60

Foundry Ferrochrome

Contract prices, cents per lb of alloy. Noncontract prices add 2.50¢ per lb. High carbon 8 Mesh and down. 62 to 66% Cr, 5 to 7% C, 7 to 10% Si.

Carloads, bulk	23.25
Carloads, packed	24.15
Ton lots, packed	27.25

High-Nitrogen Ferrochrome

Low-carbon type: 67-72% Cr, 0.75% N. Add 5¢ per lb to regular low carbon ferrochrome price schedule. Add 5¢ for each additional 0.25% N.

Chromium Metal

Contract prices, per lb chromium contained, packed, delivered, ton lots. 97% min. Cr, 1% max. Fe.

0.10% max. C	\$1.14
0.50% max. C	1.10
9 to 11% C	1.02

Low Carbon Ferrochrome Silicon

(Cr 34-41%, Si 43-49%, C 0.05% max.) Contract price, carloads, f.o.b. Niagara Falls, freight allowed; lump 4-in. x down, bulk 2-in. x down, 21.75¢ per lb of contained Cr plus 12.40¢ per lb of contained Si. Bulk 1-in. x down, 21.90¢ per lb contained Cr plus 12.60¢ per lb contained Si.

Calcium-Silicon

Contract price per lb of alloy, dump, delivered.

30-33% Ca, 60-65% Si, 3.00% max. Fe.	
Carloads	19.00
Ton lots	22.10
Less ton lots	23.60

Calcium-Manganese-Silicon

Contract prices, cents per lb of alloy, lump, delivered.

16-20% Ca, 14-18% Mn, 53-59% Si.	
Carloads	20.00
Ton lots	22.30
Less ton lots	23.30

V Foundry Alloy

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis. V-5: 38-42% Cr, 17-19% Si, 8-11% Mn.

Ton lots	16.50¢
Less ton lots	17.75¢

Graphidox No. 4

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis. Si 48 to 52%, Ti 9 to 11%, Ca 5 to 7%.

Carload packed	12.00¢
Ton lots to carload packed	19.00¢
Less ton lots	20.50¢

SMZ

Contract price, cents per pound of alloy, delivered, 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe, 1/2 in. x 12 mesh.

Ton lots	17.50
Less ton lots	29.50

Ferroalloy Prices

Ferromanganese

78-82% Mn, maximum contract base price, gross ton, lump size. F.o.b. Niagara Falls, Alloy, W. Va., Welland, Ont., Ashtabula, O. \$185 F.o.b. Johnstown, Pa. \$187 F.o.b. Sheridan, Pa. \$185 F.o.b. Etna, Clairton, Pa. \$183 \$2.00 for each 1% above 82% Mn, penalty, \$2.15 for each 1% below 78% Briquets—Cents per pound of briquet, delivered, 66% contained Mn.

Carload, bulk	10.95
Ton lots	12.55

Spiegeleisen

Contract prices gross ton, lump, f.o.b.

16-19% Mn	19-21% Mn
3% max. Si	3% max. Si
Palmerton, Pa. \$74.00	\$75.00
Pgh. or Chicago	75.00

Manganese Metal

Contract basis, 2 in. x down, cents per pound of metal, delivered.

96% min. Mn, 0.3% max. C, 1% max. Si, 2.5% max. Fe.	
Carload, packed	24.75
Ton lots	26.25

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, cents per pound.

Carloads	28
Ton lots	30
Less ton lots	32

Medium Carbon Ferromanganese

Mn 80% to 85%, C 1.25 to 1.50. Contract price, carloads, lump, bulk, delivered, per lb. of contained Mn

Calcium Metal

Eastern zone contract prices, cents per pound of metal, delivered.

	Cast	Turnings Distilled
Ton lots	\$2.05	\$2.95
Less ton lots	2.40	3.30
		4.55

Silicomanganese

Contract basis, lump size, cents per pound of metal, delivered, 65-68% Mn, 18-20% Si, 1.5% max. C. For 2% max. C, deduct 0.2¢.

Carload bulk	9.90
Ton lots	11.55
Briquet, contract basis carlots, bulk delivered, per lb of briquet	11.15
Ton lots	12.75

Silvery Iron (electric furnace)

Si 14.01 to 14.50 pct, f.o.b. Keokuk, Iowa, or Wenatchee, Wash., \$92.50 gross ton, freight allowed to normal trade area. Si 15.01 to 15.50 pct, f.o.b. Niagara Falls, N. Y., \$90.00. Add \$1.00 per ton for each additional 0.50% Si up to and including 18%. Add \$1.00 for each 0.50% Mn over 1%.

Silicon Metal

Contract price, cents per pound contained Si, lump size, delivered, for ton lots packed.

96% Si, 2% Fe	21.70
97% Si, 1% Fe	22.10

Silicon Briquets

Contract price, cents per pound of briquet bulk, delivered, 40% Si, 2 lb Si briquets.

Carload, bulk	6.95
Ton lots	8.55

Electric Ferrosilicon

Contract price, cents per pound contained Si, lump, bulk, carloads, delivered.

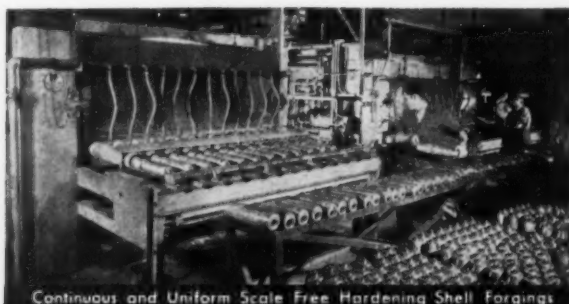
25% Si	20.00	75% Si	14.30
50% Si	12.40	85% Si	15.55
90-95% Si			17.50

Low-Carbon Ferromanganese

Contract price, cents per pound Mn contained, lump size, del'd. Mn 85-90%.

	Carloads	Ton	Less
0.7% max. C, 0.06% P, 90% Mn	26.25	28.10	29.30
0.07% max. C	25.75	27.60	28.80
0.15% max. C	25.25	27.10	28.30
0.30% max. C	24.75	26.60	27.80
0.50% max. C	24.25	26.10	27.30
0.75% max. C			
7.00% max. Si	21.25	23.10	24.30

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If perforated metal is required for any of your products, let Hendrick quote on fabricating it to your specifications. An unsurpassed stock of tools and dies, and ample plant facilities, enable Hendrick to give unexcelled service in furnishing perforated metal with any shape or size of openings from any commercially rolled metal, in any desired gauge. Write for full information.

1876—Seventy-Fifth Anniversary—1951

HENDRICK

Manufacturing Company

37 DUNDAFF STREET, CARBONDALE, PENNA.

Sales Offices In Principal Cities

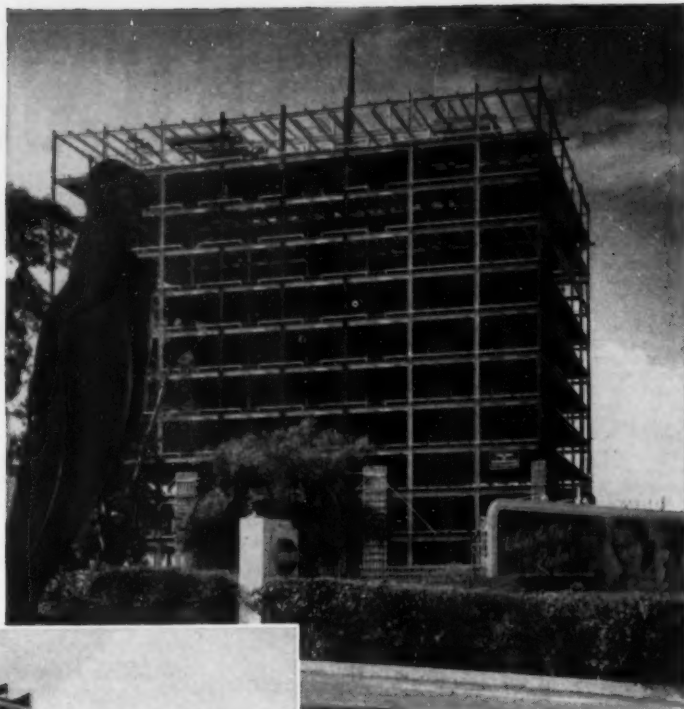


Perforated Metals
 Perforated Metal Screens
 Wedge-Slot Screens
 Architectural Grilles
 Mitco Open Steel Flooring,
 Shur-Site Treads, Armorgrids

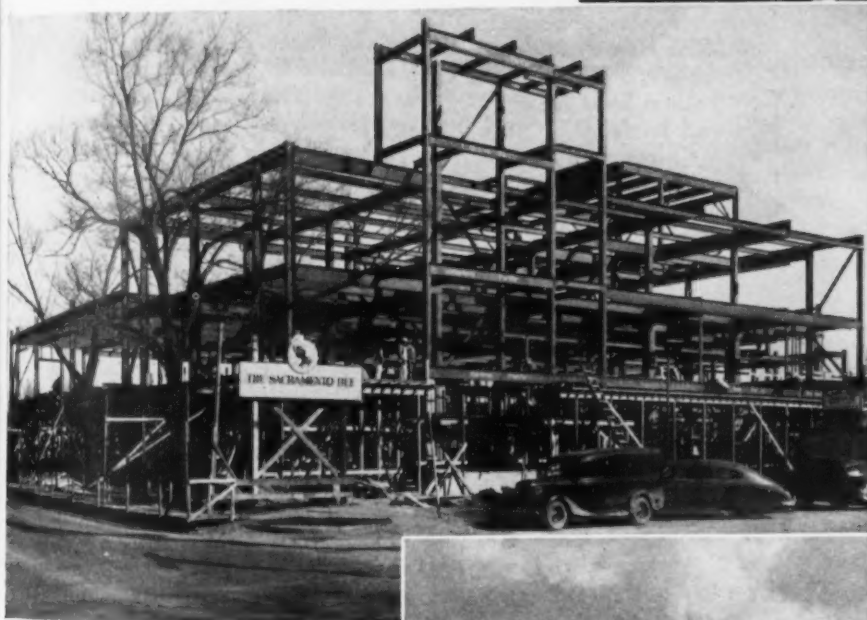
Ferroalloy Prices—

Alsifer, 20% Al, 40% Si, 40% Fe, contract basis, f.o.b. Suspension Bridge, N. Y.	
Carload	9.90¢
Ton lots	11.30¢
Calcium molybdate, 45-40%, f.o.b. Langeloth, Pa., per pound contained Mo.	\$1.15
Ferrocolumbium, 50-60%, 2 in. x D, contract basis, delivered, per pound contained Cb.	
Ton lots	\$4.90
Less ton lots	4.95
Ferro-Tantalum-columbium, 20% Ta, 40% Cb, 0.30 C. Contract basis, delivered, ton lots, 2 in. x D, per lb of contained Cb plus Ta	\$2.75
Ferromolybdenum, 55-75%, f.o.b. Langeloth, Pa., per pound contained Mo.	\$1.32
Ferrophosphorus, electrolytic, 23-26%, car lots, f.o.b. Sigio, Mt. Pleasant, Tenn., \$3 unitage, per gross ton	\$65.00
10 tons to less carload	75.00
Ferrotitanium, 40%, regular grade, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa. freight allowed, ton lots, per lb contained Ti	\$1.35
Ferrotitanium, 25%, low carbon, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti	\$1.50
Less ton lots	1.55
Ferrotitanium, 15 to 18%, high carbon, f.o.b. Niagara Falls, N. Y., freight allowed, carload per net ton	\$177.00
Ferrotungsten, standard, lump or 1/4 x down, packed, per pound contained W, 5 ton lots, delivered	\$5.00
Ferrovanadium, 35-55%, contract basis, delivered, per pound, contained V.	
Openhearth	\$3.00-\$3.10
Crucible	3.10-3.20
High speed steel (Primus) 3.20-3.35	
Molybde oxide, briquets or cans, per lb contained Mo, f.o.b. Langeloth, Pa.	\$1.14
bags, f.o.b. Washington, Pa., Langeloth, Pa.	\$1.13
Simanal, 20% Si, 20% Mn, 20% Al, contract basis, f.o.b. Philo, Ohio, freight allowed, per pound	
Carload, bulk lump	14.50¢
Ton lots, bulk lump	15.70¢
Less ton lots, lump	16.20¢
Vanadium pentoxide, 56-59% V ₂ O ₅ , contract basis, per pound contained V ₂ O ₅	\$1.25
Zirconium, 35-40%, contract basis, f.o.b. plant, freight allowed, per pound of alloy.	
Ton lots	21.00¢
Zirconium, 12-15%, contract basis, lump, delivered, per lb of alloy.	
Carload, bulk	7.00¢
Boron Agents	
Contract prices per lb of alloy, del. Boron, f.o.b. Philo, Ohio, freight allowed, B, 3-4%, Si, 40-45%, per lb contained B	\$5.25
Bortam, f.o.b. Niagara Falls	
Ton lots, per pound	45¢
Less ton lots, per pound	50¢
Carbortam, Ti, 15-21%, B, 1-2%, Si, 2-4%, Al, 1-2%, C, 4.5-7.5%, f.o.b. Suspension Bridge, N. Y., freight allowed.	
Ton lots, per pound	10.00¢
Ferroboreon, 17.50% min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C, 1 in. x D. Ton lots	\$1.20
F.o.b. Wash., Pa.; 100 lb up	.55
10 to 14% B	1.30
14 to 19% B	1.50
19% min. B	
Grainal, f.o.b. Bridgeville, Pa., freight allowed, 100 lb and over.	\$1.00
No. 1	85¢
No. 6	50¢
No. 79	
Manganese-Boron 75.00% Mn, 15-20% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C, 2 in. x D, del'd	\$1.40
Ton lots	1.57
Less ton lots	
Nickel-Boron 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni, delivered.	\$1.80
Less ton lots	
Silicaz, contract basis, delivered.	45.00¢
Ton lots	

NEW Steel Construction by BETHLEHEM PACIFIC



AT LOS ANGELES—Framework for the first of three units of the new Tishman office building on Wilshire Boulevard. Each of these 12-story, limit-height structures will provide 200,000 sq ft of air-conditioned office space. Bethlehem Pacific is fabricating and erecting the 3600 tons of structural steel for the project. The general contractor is C. L. Peck. The architect is Claud Beelman. The engineers are Brandow and Johnson.



AT SACRAMENTO — Framework for the new press building of The Sacramento Bee. This is one of two adjoining structures to be erected for the McClatchy Newspapers. Designed to provide space for the press room, composing room, stereotype foundry and editorial offices, this building contains approximately 350 tons of structural steel.

Bethlehem Pacific is handling the steel fabrication and erection of both buildings. The general contractor is Lawrence Construction Co. Architects and engineers are Lockwood-Greene, Inc.



AT SAN DIEGO—The new Midway Drive Bridge across the San Diego River flood control channel. This 11-span, 1291-ft structure required 1700 tons of steel. Except for the vertical stiffeners, the girders are made of Mayari R low-alloy, high-strength steel. Bethlehem Pacific is handling the fabrication and erection. Guy F. Atkinson Co. is the contractor on the substructure; the Vinson Construction Co. of Phoenix is the contractor for the roadway decking. Consulting Engineers are Sverdrup and Parcel, Inc.

BETHLEHEM PACIFIC COAST STEEL CORPORATION

Fabricating Works: Los Angeles, Alameda, South San Francisco, Seattle

BETHLEHEM PACIFIC

